CHAPTER ONE

(Go to www.coronafire.org for all other chapters)

Contractor's Job Site & Fire Safety Guide

Contents:

- Job Site Safety
- Responsibilities and Expectations of Contractors
- Plan Submittal Requirements
- Inspection Information

Purpose:

To provide information regarding frequently asked questions pertaining to the requirements of contractors responsible for the construction, alteration or demolition of buildings.

JOB SITE AND FIRE SAFETY GUIDE

Welcome to the Corona de Tucson Fire District

INTRODUCTION

This guide is provided by the Corona de Tucson Fire District (CDTFD) Fire & Life Safety division as a service to the construction and design community to assist you with completing your project.

This guide is not all inclusive. Although a pre-construction meeting is not required, it is highly recommended as it may help to avoid changes or additional requirements pertaining to your project.

SCOPE

The purpose of this publication is to provide information regarding frequently asked questions pertaining to the fire code and issues that are applicable to construction sites. Additionally, this guide provides important inspection and testing information as well as Certificate of Occupancy requirements that will assist you in the successful completion of your project. Some topics included within this guide have additional, more detailed specifications. In these instances, you will be referred to the appropriate chapter and/or page number for additional details.

Our goal is to achieve compliance with the Corona de Tucson Fire District's fire code requirements by partnering with you and assisting with the completion of your project within your required deadlines. In order to be successful in this endeavor, communication is critical. Your project will be assigned to a Fire Inspector and through communicating your issues and concerns to the Fire Inspector in a timely manner, a solution can generally be found that will satisfy everyone.

Ideally, you should interact with the same inspector throughout the life of the project, however, there may be occasions when your assigned inspector may not be available. In that case, another qualified inspector will be assigned to conduct inspections to avoid delays in the completion of your project.

Your cooperation in observing these regulations and making other responsible parties aware of the safety requirements outlined in this document is greatly appreciated.

If you have any questions, please contact your assigned fire inspector or call the Fire & Life Safety division at 520-762-5007.

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1. GENERAL INFORMATION

Fire safety during the construction, alteration, or demolition of a building is critical for the safety of job site employees, fire prevention personnel, firefighters and the general public. The following is a general outline of preconstruction requirements and specific information pertaining to each requirement. This guide also covers the minimum fire code requirements for a final fire inspection required for a full Certificate of Occupancy from a Building Inspector.

A pre-construction meeting is highly recommended for the General Contractor, all fire protection contractors and the Fire Inspector to discuss general and/or specific requirements, concerns and issues or to aid in obtaining permits that may be required during the course of the project.

GENERAL CONTRACTOR RESPONSIBILITIES

The General Contractor is responsible for the fire safety of all property under their control; therefore, the General Contractor will ultimately be held responsible for any fire code violations that may occur on the job site. The General Contractor is also responsible for maintaining copies of all approved, stamped plans on site as well as copies of all permits and inspection reports. **Inspections will not be performed without approved plans on site and may result in additional fees being assessed.**

FIRE PROTECTION CONTRACTOR RESPONSIBILITIES

Fire Detection and Fire Suppression System Contractors are each separately responsible for providing and maintaining their respective approved, stamped set of plans on site. See **Chapter 1-4: Plan Submittal Requirements** for additional details. Inspections will not be performed without approved plans on site and may result in additional fees being assessed.

Fire Detection and Fire Suppression System Contractors are also responsible for verifying their systems are ready (pre-tested) for inspection, which includes verifying that the project is installed according to approved plan(s) prior to calling for any inspection.

Whenever possible, Fire Detection and Fire Suppression System Contractors shall coordinate with each other and the General Contractor/Superintendent to schedule inspections to be performed at the same time.

2. PLAN SUBMITTAL REQUIREMENTS

The Corona de Tucson Fire District reviews building, and fire protection system plans for all types of commercial and residential construction and remodeling.

The contractor is responsible for ensuring that the system(s) being installed or modified comply with all locally adopted codes including but not limited to the current adopted edition of the International Fire Code, referenced NFPA Standards, and local amendments.

Please review ALL submittal requirements prior to turning in your plans; incomplete submittals will be returned to the applicant and resubmittals will incur additional plan review fees. All signed checklists must accompany plans at time of submittal.

Plans approved by the Corona de Tucson Fire District give authorization for construction. Final approvals are subject to field verification. Any approval issued by the District does not release the contractor or property owner from the responsibility of full compliance with all applicable codes and ordinances relating to the construction project.

All installations must reflect the approved plans. Any deviation from the approved plans requires a re-submittal to the District prior to inspection. All plan review and inspection process steps must be followed. Deviation from the requirements may result in delays.

ADOPTED FIRE CODE AND AMENDMENTS

The Corona de Tucson Fire District has adopted the International Fire Code (IFC) with local amendments. Please visit our website at: https://www.coronafire.org for information on the current edition of the adopted codes and amendments or contact the Fire & Life Safety Division at 520-762-5007

WHERE TO SUBMIT PLANS

Pima County: For projects located within Pima County, plans must be submitted directly to the Corona de Tucson Fire District Fire & Life Safety division digitally through the website, www.coronafire.org

REVIEW TIMELINES

Plans are reviewed on a first come, first served basis and are queued by the date received. Date received time stamps begin when full submittals are received including all required checklists, forms, and technical data sheets. We will make every effort to review your project within a window of ten (10) business days, however dependent upon volume, time frames may be greater. In times of high volume, plan reviews may be conducted by a third party. When a third-party review is conducted, you will be assessed the third-party rate in addition to the plan review fees for this service.

EXPEDITED PLAN REVIEW

You may request an expedited review of your project. Expedited plan review services are subject to staff availability and current work volumes, and/or they may be conducted by a third party. When a third-party review is conducted, you will be assessed the third-party rate for expedited service in addition to the plan review fees for this service.

FIRE SPRINKLER PLANS

All plans and specifications for commercial fire sprinkler systems submitted for review shall be sealed by an Arizona design professional qualified in fire sprinkler system design or NICET/CSA level III or higher.

Fire sprinkler system installation information shall be provided on the appropriate drawings. This includes any modifications to existing systems. Plans shall be reviewed, approved, and on site prior to work beginning.

FIRE ALARM PLANS

All plans and specifications for fire alarm systems submitted for review shall be sealed by an Arizona design professional qualified in fire alarm system design or NICET/CSA level III or higher.

Fire alarm system installation information shall be provided on the appropriate drawings. This includes any modifications to existing systems. Plans shall be reviewed, approved, and on site prior to work beginning.

3. CONSTRUCTION/SALES TRAILER



Depending on the jurisdiction of your project, a building permit may be required for a temporary construction/sales trailer.

A fire sprinkler or fire alarm system is not required for temporary construction/sales trailers. However, when construction/sales trailers are equipped with fire suppression and/or fire detection systems, permits and acceptance tests are required for the installation of the systems. Fire protection systems must be maintained while the trailer is on site.

When the trailer utilizes a generator using flammable or combustible liquids, a fire permit may be required. See **Chapter 1-17: Generators Utilizing Flammable or Combustible Liquids** for specific details on fire permit applications prior to placing the generator in service.

4. FIRE APPARATUS ACCESS ROADS GENERAL REQUIREMENTS

Fire apparatus access roads are required at all phases of a project and shall be maintained throughout construction to allow emergency response vehicles onto the construction site for fire, emergency medical services, and technical rescue situations.

Fire apparatus access roads shall be in place prior to combustible construction materials being brought onto the site or prior to start of vertical construction, whichever comes first. In some cases, depending on the circumstances, access roads may be required at an earlier stage of the project.

- Each site should have a minimum of two access points into the site. The access points shall be a minimum of 20 feet wide with 13 feet 6 inches of vertical clearance and shall be maintained accessible at all times.
- For buildings 30 feet or more in height, two fire access roads a minimum of 26 feet wide are required.
- Temporary or permanent access roads shall be capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.
- All fire apparatus access roads shall be provided with a drive-through access or an approved turn-around. An approved turn-around is required when the road length exceeds 150 feet.
- Fire apparatus access roads shall extend to within 150 feet of all portions of the building to include all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building.
- The edges of the access road shall be obvious or clearly marked. In cases where markings are not practical, not possible or markings are not visible, curbing shall be installed.
- Open trenches cut across any fire apparatus access roads shall be plated at all times with steel plates capable of maintaining the integrity of the fire apparatus access road design and must be filled in and resurfaced by the end of the working day.
- Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles.

ACCESS REQUIREMENTS FOR NEW CONSTRUCTION SITES

1. Signage shall read FIRE DEPARTMENT ACCESS and shall include site address, or range of addresses, for all commercial sites and residential model homes.
    a. **Size.** The two-sided sign plate shall be a minimum of 4x4 feet with a thickness of ¾ inch graded plywood.
    b. **Color.** The sign shall be two-sided and have a red background with white letters.
    c. **Location.** Signs shall be installed at each point ofentry.
2. One temporary FD access road shall be provided prior to vertical construction of structures.
    a. The access road shall be a minimum of 20 feet wide with a vertical clearance of 13 feet 6 inches.
    b. Turning radii shall be 42 feet 8 inches minimum outside radius, 20 feet 3 inches minimum inside radius (WB-40).
    c. Fire department access roads shall be designed and maintained by the contractor/builder at all times during construction. Access roads shall be within 200 feet of all portions of the facility or all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the

building or facility.

d. If the building is more than one story, the access road must be within 200 feet of the center of the furthest room on the second floor (or level). Travel shall be measured along normal pedestrian routes. One flight of stairs (a minimum of 44 inches wide) shall count as 30 feet. Dead end fire access roads that exceed 150 feet in length require an approved turn-around.

e. A road surface made up of ABC or other approved materials compacted to 90% and capable of supporting fire apparatus vehicles 83,000 pound gross vehicle weight (GVW) under any weather condition. The temporary all-weather surface shall be maintained by the builder for intended use by the fire department during the construction process.

3. One hydrant must be operational and accessible prior to combustibles being delivered on site.

   a. Hydrants shall be located so that they are not more than 400 feet away from combustible construction to account for hose lay length. Distance is measured as the fire truck travels, not line of sight.

TEMPORARY FIRE DEPARTMENT ACCESS SIGNAGE

All fire apparatus access roads shall be clearly marked at the entrance with an approved sign approximately 4 feet by 4 feet in size. The lettering shall be white on a red background that states, "FIRE DEPARTMENT ACCESS". If appropriate, the use of arrows may be approved by your Fire Inspector. Also, additional access road markings may be required throughout the project.



TEMPORARY ACCESS ROAD SPECIFICATIONS DURING CONSTRUCTION

During construction, temporary access roads may be approved when in compliance with the following minimum requirements:

- The fire apparatus access road shall be an all-weather driving surface, graded to drain standing water and engineered to bear the imposed loads of fire apparatus when the roads are wet. The minimum surface shall be 6 inches of ABC compacted to 90 percent over an approved base and shall support the minimum weight of 83,000 pounds. Compaction test results shall be provided to the Fire Inspector prior to approval. Alternate methods may be approved when designed and sealed by a professional engineer (PE) registered by the State of Arizona and approved by the Fire District.

- The contractor or person in charge of any commercial building construction site whose structures total more than 4,000 square feet shall provide and maintain fire lanes as shown on approved site plans. Fire lanes shall be constructed of asphalt, concrete or other alternative material pre-approved by the Fire Marshal or Fire Code Official. Fire lanes shall be sufficient to support fire apparatus:

    - **Concrete:** 41-ton weight limit required (83,000 lbs)

    - **Asphalt:** 41-ton weight limit required (83,000 lbs)

    - **Gravel:** 41-ton weight limit required (83,000 lbs)

        - Minimum one (1) inch rock, six (6) inches deep with underlay approved by the Fire Marshal or Fire Code Official on a compacted sub-grade. OR

        - Minimum six (6) inches of Aggregate Base Course (ABC) compacted to 90 percent over an approved base and graded so that ponding does not occur after rainfall.

5. FIRE HYDRANTS





Fire hydrants shall be in place and operational prior to combustible construction materials being brought onto the site. Operational is defined as being fully tested, chlorinated, and approved by the water department and CDTFD. A hydrant shall be located within 400 feet of stored combustible construction materials. Additional hydrants shall be installed in accordance with the Town of Oro Valley/Marana or Pima/Pinal County requirements.

The use of temporary piping and hydrant systems, while discouraged, is acceptable provided the hydrant can operate at the required flow rate. **Plans for such a system must be submitted and approved by CDTFD prior to installation.**

There are a number of common errors possible with respect to the installation of new fire hydrants. Most have to do with variations between preliminary grading designs and final grading. Others involve specific uses of areas near where hydrants are installed. If these issues are not monitored, hydrants can end up being situated in such a manner that they, at best, look strange and, at worst, are difficult or impossible to operate.

Hydrant installation details need to be coordinated among all parties involved at the construction site. If hydrants are being installed in areas to be landscaped or if final grading elevations are not clear, the specified hydrant design should easily accommodate placement of riser extensions of various lengths so that the final hydrant installation is compatible with the final grade elevation.

As a general rule, no equipment or facilities shall be located within three feet of the hydrant body, or placed in front of any hydrant outlet, or be placed between the hydrant and the roadway. Persons responsible for installing landscaping near hydrants should be apprised of these conditions as walls, plants and other landscape materials must be kept outside the hydrant's clearance space.

The center of a hose outlet shall be not less than 18 inches above final grade.

Hydrants shall be protected if subject to mechanical damage. Protection shall be arranged in a manner that will not interfere with the connection to, or operation of, hydrants. Hydrants shall be provided and spaced in accordance with the requirements of the Authority Having Jurisdiction (AHJ).

6. FIRE EXTINGUISHERS

Fire extinguishers sized for not less than ordinary hazard (2 A:10-B:C) are required in buildings under construction, alteration or demolition **at each stairway on all floor levels** where combustible materials have accumulated, as well as **in every storage and construction shed.**

Extinguishers shall be installed in plain view in an accessible location, and away from hazardous areas. Additional extinguishers shall be provided where special hazards exist.



7. COMBUSTIBLE WASTE

Combustible waste shall not be allowed to accumulate on any site except in approved containers. Waste material **shall be removed from the building on a daily basis.** Combustible debris, waste material, or trash shall not be burned on the construction site.



8. ASPHALT KETTLES





Asphalt (tar) kettles and pots shall not be used inside or on the roof of a building or structure. Kettles **shall not** be located within 20 feet of any combustible material, combustible building surface, or any building opening, and within a controlled area identified by the use of traffic cones, barriers or other approved means.

Roofing kettles and operating asphalt (tar) kettles shall not block emergency escape routes, gates, roadways or entrances. There must be an attendant within 100 feet of an operating kettle who is knowledgeable of these types of operations and hazards. The attendant shall have the kettle within sight during operation. Ladders or similar obstacles **shall not** form a part of the route between the attendant and the kettle.

A portable fire extinguisher with a minimum **40-B:C** rating shall be located within 25 feet of each kettle being utilized and an additional minimum **3A:40-B:C** rated fire extinguisher shall be located on the roof being covered.

9. HEATERS

All heaters used in structures must be designed and approved for indoor use. Heaters shall not be used in areas where they will create a hazard. Adequate ventilation must be provided for fuel burning heaters. Heaters must be turned off, moved a safe distance from any structure, and allowed to cool before fueling.





10. HOT WORK





Any person using a torch or other flame-producing device for removing paint, sweating pipe joints, applying roofing materials, or any other process requiring an open flame device in any building or structure **shall provide one approved fire extinguisher (minimum size 2A:20-B:C) within 30 feet.** Hot work areas shall not contain combustibles or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

In all cases, a fire watch shall be maintained in the vicinity of the operation for no less than 30 minutes after the torch or flame-producing device has been used. The individuals responsible for performing the hot work as well as the individuals responsible for providing the fire watch shall be trained in the use of portable fire extinguishers.

11. WARMING FIRES





Warming fires at construction sites shall comply with the following:

- No warming fires shall be ignited or maintained unless the fire is contained in an APPROVED waste burner located at least 25 feet from any structure.
- An approved waste burner is an intact 30 or 55-gallon metal drum with a spark arrester constructed of iron or heavy wire mesh with openings no larger than ½-inch.
- The fire must be attended AT ALL TIMES by a competent person who shall have a garden hose (minimum 5/8-inch diameter) pre-connected to a reliable water supply OR a 2-A:10-B:C (or larger) fire extinguisher. This means somebody must be specifically assigned to attend the fire. It is NOT permissible to leave the fire unattended and the fire must be completely extinguished before it can be left unattended.
- The warming fire shall be extinguished when the burning of material causes or creates dense smoke or odor.
- All burning shall meet the requirements of the Pima Department of Environmental Quality (PDEQ). You must check daily to see if it is permissible to burn.

The Fire Marshal may prohibit any and all fires when deemed hazardous.

12. HAZARDOUS MATERIALS STORAGE AND USE

STORAGE AND USE OF FLAMMABLE LIQUIDS





A FIRE PERMIT may be required for the storage or use of more than 5 gallons of flammable liquids or 25 gallons of combustible liquids. Flammable and combustible liquids shall be stored in an area approved for flammable/combustible liquid storage. Consult with your Fire Inspector.

The storage of all flammable liquids must be in safety containers designed for their use. **Flammable liquids shall not be stored in buildings under construction.**

All containers must be labeled identifying the liquid they contain and the words:

FLAMMABLE – KEEP FIRE AND FLAME AWAY - KEEP 50 FEET FROM BUILDINGS.

STORAGE AND USE OF COMPRESSED OR LIQUEFIED GASES



Cylinders, valves, regulators, hoses as well as other apparatus and fittings for oxygen shall be kept free from oil and grease. Oxygen cylinders, apparatus, and fittings shall not be handled with oily hands, oily gloves, greasy tools or equipment.

Acetylene gas shall not be piped unless using approved cylinder manifolds and connections. Cylinders shall be located away from the hot work area to prevent them from being heated radiantly or ignited due to sparks, slag, or misdirection of the torch flame. All cylinders shall be secured to prevent dislodgement and access by unauthorized persons.

See **Chapter 1-14: Hot Work** for additional details.

GENERATORS UTILIZING FLAMMABLE OR COMBUSTIBLE LIQUIDS





A site plan showing distance from buildings, property lines, public right-of-way and grounding specifications fee shall be submitted to the Corona de Tucson Fire District prior to installation.

An inspection and approval of the installation of the generator will be required before operation of the generator.

Annual generator inspection reports will be required and will need to be produced upon request by CDTFD.

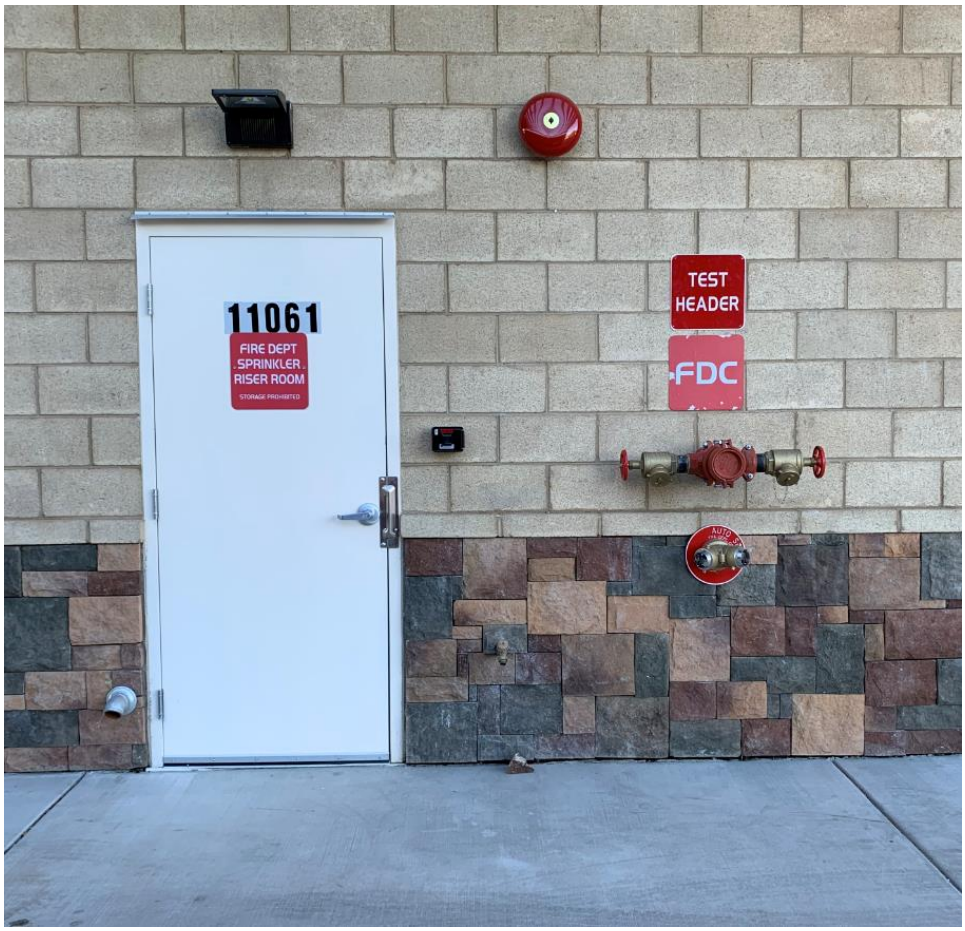
13. FIRE PUMP ROOMS AND FIRE RISER ROOM REQUIREMENTS

Fire pump and automatic fire sprinkler system riser rooms shall be located in a dedicated room and have a door directly accessible from the exterior of the building.

The room shall be designed with adequate space for all equipment necessary for the installation (as defined by the manufacturer), with sufficient working space around the stationary equipment.

Fire pump and automatic fire sprinkler system riser rooms shall be provided with door(s) and an unobstructed passageway large enough to allow removal of the largest piece of equipment.

SIGNS: Each fire pump and fire sprinkler riser room door shall be identified by a permanent weather resistant sign in compliance with CDTFD specifications. See **Chapter 3: Fire Department Signage** for details and specifications.



14. FIRE DEPARTMENT CONNECTION REQUIREMENTS

- All Fire Department Connections (FDCs), fire department hose connections and standpipe hose connections for fire department use shall be 2½" national standard threads.
- FDCs shall be protected with Knox 2½" locking FDC Plugs. Knox FDC caps are available to order online at:

  https://www.knoxbox.com
- FDCs shall be located a maximum of 200 feet from the nearest fire hydrant. Fire hydrants and FDCs shall be on the same side of the drive entrance to prevent access obstruction.
- The location of fire department connections shall be approved by the Fire Code Official.
- NFPA 13 fire sprinkler systems shall be installed with 2½" female swivels with national standard threads.
- NFPA 13R sprinkler systems shall be installed with a single female swivel with 2½" national standard threads.





FDC SIGNS

Each Fire Department Connection (FDC) shall be identified by a permanent weather resistant sign in compliance with CDTFD specifications. See **Chapter 3: Fire Department Signage** for details and specifications. When the system supplied by the FDC does not supply the entire building or supplies multiple buildings, signs shall identify the areas of the building supplied by the FDC. The fire department connection sign shall identify the building address or area, where necessary, and type of system the FDC supplies. Consult with your Fire Inspector prior to ordering signage.

TEST HEADER SIGNS

Each forward flow test header shall be identified by a permanent weather resistant sign stating TEST HEADER.

15. ADDITIONAL BUILDING REQUIREMENTS

KNOX BOXES, KEY SWITCHES, ETC.





A Knox Box, padlock, key switch, elevator key box or other Knox devices may be required. Please refer to **Chapter 4: Knox Boxes, Switches, Etc.** for device requirements, model numbers, locations and ordering information.

- Required Knox box or Knox device locations should be noted on the approved plans. If not, please coordinate with your Fire Inspector regarding location, number and type of devices required. Once approved, Knox boxes and other Knox products are available to order online at:

  https://www.knoxbox.com

- For security purposes, it is highly recommended that wall-mounted boxes be recess mounted. Early attention to this requirement will allow appropriate construction decisions to be made to facilitate the installation.

- Following installation, keys are locked into the Knox box by the Fire Inspector.

GATES

For all information and requirements pertaining to the installation of automatic gates, please see **Chapter 6: Automatic Gates** for details.

For all information and requirements pertaining to the installation of manual and pedestrian gates, please see **Chapter 7: Manual & Pedestrian Gates** for details.

ADDRESS DISPLAY REQUIREMENTS

Approved address numbers shall be visible from the street, mounted on the building or on a roadway monument. The building and suite numbers must be posted at time of Certificate of Occupancy. Refer to Pima County Addressing Codes as appropriate for details.

16. STOP WORK ORDERS

Stop Works Orders are issued to immediately halt construction work, cease business operations or prohibit use or occupancy of a property in order to gain compliance with state and local codes, ordinances and regulations. Stop Work Orders also provide a course of action to be taken when a condition exists that presents a distinct hazard or causes a threat to life or property.

The purpose of Stop Work Orders are to protect workers, tenants, the general public, buildings and properties from unsafe conditions. Stop Work Orders do not necessarily stop all work on a site and certain work may still be allowed to continue as determined by the Fire Code Official.

The most common use of a Stop Work Order occurs at construction sites that have combustible materials onsite without the approved required access and/or firefighting water supply in place. Other occasions when a Stop Work Order may be issued include, but are not limited to:

- Performing improvements, modifications or construction without proper permits;
- Preventing additional work (usually at a construction site) from taking place until specific code or other life safety requirements are met;
- Evacuation or closure of a facility is necessary to abate a situation where the building has been deemed hazardous to life and property.

When an authorized representative of a building, site or operation has been issued a Stop Work Order, the only permissible work is that which is necessary to bring the violations or unsafe conditions into compliance.

Stop Work Order Procedure:

1. The Stop Work Order is prepared, and notification is made to the general contractor, owner or occupant in charge at the site.
2. A Stop Work Order placard will be posted at each entrance to the premises or site. Each placard will be photographed.
3. The Fire Code Official will photograph each violation or hazardous condition.
4. If necessary, the building, premises or site will be evacuated, and all operations shall cease immediately except of those allowed to continue by the Fire Code Official.
5. The general contractor, owner(s) and occupant(s) will be provided with written documentation of all violations to be corrected.
6. If applicable, any scheduled construction inspections will be cancelled, and no additional inspection appointments will be scheduled until further notice.
7. Depending on the jurisdiction, the Fire Code Official will contact the Building Officials for coordination and communication.
8. Activities, work or inspections may resume once items identified on the Stop Work Order have been addressed to the satisfaction of the Fire Marshal or designee.

17. GENERAL FIRE SPRINKLER SYSTEM REQUIREMENTS

All automatic fire sprinkler systems shall be installed or modified by a contractor licensed to perform such work by the State of Arizona Registrar of Contractors (ROC).

Automatic fire sprinkler systems shall be supervised by an approved central, proprietary or remote signal station service in all occupancies that are NFPA 13 or NFPA 13R compliant.

Automatic sprinkler risers for 13D systems shall be located in the wall cavity with an access panel. Access panels doors can open to the inside or the outside of the residence.

OUTSIDE RISERS ARE NOT APPROVED





**APPROVED **





18. FIRE INSPECTIONS AND TESTING

****APPROVED PLANS MUST BE ON SITE DURING CONSTRUCTION AND TESTING****

1. All requests for inspections and testing shall be made through the Corona de Tucson Fire District Fire District website, https://www.coronafire.org a minimum of two (2) business days in advance. You will then be contacted by the inspector to schedule/confirm day and time of inspection.
2. Approved plans bearing a **FIRE DISTRICT APPROVAL STAMP** shall be on the job site at all times. **Inspections or tests will not be conducted without them.** Plans depicting multiple options and plans that do not accurately reflect the location of water service, riser locations etc. will not be approved and/or may lead to an inspection failure due to construction not conforming to approved plans.
3. Separate permits are required for each system. Examples of separate plan submittals for fire permits include but are not limited to: Fire Sprinkler Systems, Fire Sprinkler Monitoring, Fire Alarm Systems, and Kitchen Hood Suppression Systems.
4. Fire protection systems shall be **pre-tested** by the contractor and all corrections made prior to calling for an acceptance inspection.
5. **The permit fee is calculated to include primary tests or inspections.**
6. Acceptance test inspections are for the system covered by the permit. This may include the entire building, only a portion of the building, or a piece of equipment. If it is necessary (or if you choose) to test a single system in phases requiring more than the allotted inspections for the permit, additional inspection fees may apply. It is recommended you consult with your Fire Inspector to discuss an inspection strategy.
7. Unless otherwise approved in writing through the alternate means and methods section of the fire code, all systems shall be designed and installed in accordance with the Corona de Tucson Fire District adopted fire code and standards. This is not always the most current edition of the standard or code. It is the contractor's responsibility to use the proper adopted standard. For information on the current edition of the adopted code or amendments, please contact your Fire Inspector.
8. If your project requires your installers to deviate from the approved set of plans, **as-built drawings** must be submitted to Corona de Tucson Fire District for review prior to scheduling the appropriate inspection. Failure to do so may result in an inspection failure with additional fees.
9. Fire Inspectors have been instructed to inspect to the approved plans and not approve installations that do not comply with those plans. Inspectors do not have authority to approve field changes that are not reflected on an approved plan.

FIRE SPRINKLER INSPECTIONS

REQUIRED INSPECTIONS

Minimum required inspections prior to approval of new fire sprinkler systems and final fire approval:

- Underground piping visual inspection and Hydrostatic 2-hour pressure test
- Riser Flush
- Overhead fire sprinkler intermediate
- Overhead fire sprinkler final
- Final fire inspection

UNDERGROUND PIPING: TWO HOUR HYDROSTATIC PRESSURE TEST

- Systems shall be tested hydrostatically at 200 psi for 2 hours (pressure test gauge at lowest end of the system being tested).
- All joints must be fully exposed.
- Thrust blocks (kickers) or other approved mechanical restraints must be in place and visible.
- Where ductile iron pipe is used, all pipe and fittings shall be wrapped.
- Where C-900 pipe is used, a tracer wire or metallic warning tape must be added in accordance with manufacturer's installation recommendations.
- The contractor completing the work shall provide the Corona de Tucson Fire District with a completed **Contractor's Material and Test Certificate for Underground Piping** (NFPA 13) form signed by the sub-contractor and general contractor upon completion of all underground piping tests and inspections.

A flush will be conducted and **WITNESSED BY A FIRE INSPECTOR** after approval of the underground pressure test. **All check valves must be in a fully open position.**

****** IMPORTANT NOTE ******

It is highly recommended you consult with your Fire Inspector, Building Inspectors, and Water Purveyors to determine who witnesses and conducts chlorination and bacteria tests of underground water lines.



OVERHEAD PIPING: TWO HOUR HYDROSTATIC PRESSURE TEST and INTERMEDIATE INSPECTION

- Systems shall be pre-tested by the contractor.
- The system shall be tested at 200 psi for 2 hours with all system piping visible from floor level.
- **NO** sheet rock or ceiling tile can be installed prior to the testing or inspection of the piping systems without the approval of the Fire Inspector.
- You will be required to remove any obstructions to viewing the complete piping system before an inspection will be conducted.
- The contractor completing the work shall provide the Corona de Tucson Fire District with a completed **Contractor's Material and Test Certificate for Aboveground Piping (**NFPA 13) form signed by the sub-contractor and general contractor upon completion of all aboveground piping tests and inspections.

FINAL FIRE INSPECTION

The fire sprinkler system shall be fully operational at the time of final inspection and the following items are required at the time of the inspection:

- **All tests shall be requested by the contractor named on the fire sprinkler permit.**
- All signage shall be installed.
- Completed NFPA 13 **Contractors Material and Test Certificates** for underground and aboveground piping have been provided to the Fire Inspector prior to inspection.
- A hydraulic calculation data plate (NFPA 13) must be installed on all calculated systems. Stamped or engraved metal or rigid plastic plates are required. The use of magic markers, embossed tape labels, or metal impression labels is NOT allowed.
- Sprinkler head box(es) shall be properly installed, stocked with sprinkler heads, wrench, and a NFPA 25 booklet. The number of heads and boxes shall be in accordance with NFPA 13.

Final acceptance testing includes the following:

- Testing of third party monitoring with the installation of over 20 sprinkler heads. This shall be coordinated with the alarm contractor. A separate fire permit is required for the monitoring of the sprinkler system. The permit must be obtained prior to testing.
- Supervision of all valves.
- Main drain test witnessed by the Fire Inspector.
- Inspector's Test and timed water flow alarm test witnessed by the Fire Inspector.
- Pressure drop test across the backflow device, if installed.
- Other tests or inspections that may be required.

FIRE ALARM INSPECTIONS

- **All tests shall be requested by the contractor named on the fire alarm permit.**
- **The entire system shall be fully installed and pre-tested** prior to scheduling the final acceptance testing of the system.
- A **Certificate of Completion** and an **Inspection and Testing Form** required by NFPA 72 shall be completed and provided to the Fire Inspector prior to acceptance testing.
- Tests performed after normal duty hours will be charged the current scheduled rate for a minimum of two (2) hours.
- All control panels, initiating and signaling devices, power supplies and auxiliary devices shall be tested in the presence of the Fire Inspector.
- All devices shall be tested in accordance with manufacturers' recommendations. It shall be the responsibility of the installing contractor to provide the equipment and supplies necessary to perform the acceptance tests including: heat guns, approved canned smoke, ladders and other necessary devices required for testing of the entire system.
- A copy of the approved plans shall be permanently maintained at the fire alarm panel.
- A Zone Map shall be provided and posted near the annunciator panel when required by the Fire Inspector. The Zone Map consists of an approved simplified floor plan of the areas served by the alarm panel. Zone descriptions and /or devices shall correspond with the floor plan. Consult with the Fire Inspector for details and posting requirements.
- The location of the Fire Alarm Control Panel (FACP) shall be identified with an approved sign. See **Chapter 3: Fire Department Signage** for details and sign specifications. Consult with your Fire Inspector on signage locations.





KITCHEN HOOD EXTINGUISHING SYSTEM INSPECTIONS







Kitchen hood extinguishing systems shall be installed in accordance with the International Fire Code (IFC), the International Mechanical Code (IMC), applicable National Fire Protection Association (NFPA) standards and the manufacturer's recommendations. The installing contractor shall perform all tests.

The testing shall include:

- All components, including remote manual pull stations, mechanical or electric devices, detectors, actuators, and interlocks shall be tested for proper operation during the inspection in accordance with the manufacturers' listed procedures.
- Gas cooking appliances shall be connected to gas lines prior to testing.
- Upon activation, the system shall shut down fuel and electricity to the appliances under the hood. The fuel and electrical supply shall not reset unless the hood suppression system is reset.
- Electric power required for acceptance testing of systems shall be provided by grid power only, not generator power. Temporary power supplied from the grid through a meter is acceptable.
- Upon activation of the system, the makeup air supply to a hood shall shut down and hood exhaust fans shall continue to run unless shutdown is required by the extinguishing system manufacturer or another component of the system requires shutdown (NFPA 96).
- Where a building fire alarm system is installed, the kitchen hood extinguishing system shall be monitored by the building fire alarm system in accordance with NFPA 72. **A separate fire alarm permit is required.**
- A Class K fire extinguisher shall be required for UL 300 compliant kitchen hood systems.

ALWAYS PRE-TEST THE SYSTEM PRIOR TO SCHEDULING A FINAL INSPECTION

19. FINAL FIRE INSPECTION CHECKLIST

In order to obtain Fire District approval on the Final Fire Inspection, the following minimum conditions must be met:

- ☐ All automatic fire protection and life safety systems and equipment including sprinklers, fire alarms, smoke control, kitchen hood systems, etc. must be installed, fully operational, tested, and approved. If third party monitoring is required, it shall be operational and verified.
- ☐ All paving must be completed, and fire lanes are properly identified with compliant signage. See **Chapter 2: Fire Lanes and Fire Access** for additional details and requirements.
- ☐ Addresses must be posted. If required, a graphic directory must be installed. See **Chapter 5: Property Address Complex Directories** for details and requirements and consult with your Fire Inspector.
- ☐ All required signage **in compliance with CDTFD specifications** must be installed. See **Chapter 3: Fire Department Signage** for specifications and details. Signage includes, but is not limited to:
    - ☐ FDC
    - ☐ Sprinkler Riser Room
    - ☐ FACP
    - ☐ Electrical Room, Mechanical Room, Boiler Room, etc.
    - ☐ F.D. Access
- ☐ Blue, reflective pavement markers must be installed for the FDC and fire hydrants. See **Chapter 2: Fire Lanes and Fire Access** for details.
- ☐ Knox boxes and locking FDC plugs must be installed. See **Chapter 4: Knox Boxes, Key Switches, etc.** for details. Provide current keys at the final inspection.
- ☐ All gates have been installed, inspected, tested and approved including key switches and pre-emption devices. See **Chapter 6: Automatic Gates** and **Chapter 7: Manual Gates** for all gate requirements.
- ☐ Proper fire extinguishers (type and quantity) must be present, mounted and tagged. Consult with your Fire Inspector.
- ☐ When installed, special locking arrangements have been inspected, tested and approved. Consult with your Fire Inspector.
- ☐ Exit signs and emergency egress lighting must be installed. Your Fire Inspector may perform a power drop during your final inspection to verify operation.
- ☐ All ceiling tiles must be in place and penetrations to fire rated assemblies must be properly sealed.

21. CERTIFICATE OF OCCUPANCY

After contacting the appropriate building department for Certificate of Occupancy inspections, all requests for **Fire Final Inspections** shall be called in to the Corona de Tucson Fire District Fire District website, https://www.coronafire.org a minimum of two (2) business days in advance. You will then be contacted by the inspector to schedule/confirm day and time of inspection.

Approved plans bearing the Fire District approval stamp and all permits must be available at the job site at all times from the start of construction through final inspection. The Fire Inspector will provide you an electronic copy of each inspection report conducted at your project. Keep this paperwork on the job site. You may be required to provide documentation that an inspection has been completed and it is expected that you will be able to provide the paperwork at the final inspection.

REMINDERS

1. Approved plans bearing a Fire District approval stamp must remain on the job site during construction and testing.
2. Always pretest your system before scheduling an inspection.
3. If you are unsure of a requirement, contact your Fire Inspector.

To schedule an inspection:

Call Corona de Tucson FD, Station 181 to Schedule. 1-(520)-762-5007

a minimum of two (2) business days in advance.

Inspection Hours:

Monday – Thursday: 8am – 5pm

Friday – Sunday: Closed

After Hours Inspections Available for Special Circumstances

CHAPTER TWO

Fire Lanes and Fire Access

Contents:

- Fire Access Plan Submittal Requirements
- Fire Lane Signs and Installation
- Alternative Fire Lane Signs
- Fire Lane Identification (Red Painted Curbs)
- Alternative Surface Fire Apparatus Roads
- Blue Reflective Markers

Purpose:

Proper fire lanes directly affect how the Fire Department is able to maneuver through a property. These fire lane standards help to ensure unimpeded access for the fire apparatus.

ACCESS REQUIREMENTS FOR NEW CONSTRUCTION SITES

See **Chapter 1-8: Access Requirements for New Construction Sites** for details and specifications. Consult with your Fire Inspector to answer any questions you may have regarding access requirements during any phase of construction.

FIRE LANE SIGNS

When required, approved signs, curb markings or other approved notices shall be provided for Fire Apparatus Access Roads. Their location should be shown on the approved plans. If fire lane signs are not shown, please consult with your Fire Inspector for assistance in determining sign locations.

All signs are to be installed perpendicular to the road and facing the direction of travel and may be required to be double sided.

FIRE ACCESS PLAN SUBMITTAL REQUIREMENTS

Digital copies of the SITE PLAN or FINAL PLAT showing the location of the following items shall be submitted for review and approval at time of initial building plan submittals.

- Project name and location
- Property lines and construction area
- Cross streets and intersections
- Emergency vehicle access sign location
- A minimum of one (1) point of access
- Access road with a minimum width of 20 feet and a minimum vertical clearance of 13 feet 6 inches
- Turning radius with a minimum outside radius of 42 feet 8 inches and a minimum inside radius of 20 feet 3 inches
- A minimum of one (1) approved fire hydrant capable of supplying the required fire flow within 400 feet travel distance of all combustibles

The following statements must be noted on the plans:

- Access roads will be designed and maintained by the contractor/builder
- Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus, at least 83,000 pounds and shall be surfaced so as to provide all-weather driving capabilities.
- Access surface will be ABC compacted to 95% or asphalt for grades up to 6%. For grades from 6% to 12%, the surface shall be comprised of asphalt type materials. For grades from 12% to 15%, surfaces shall be comprised of concrete with a traction surface. Grades shall not exceed 15% without approval from the fire code official.

FIRE LANE SIGNS & INSTALLATION

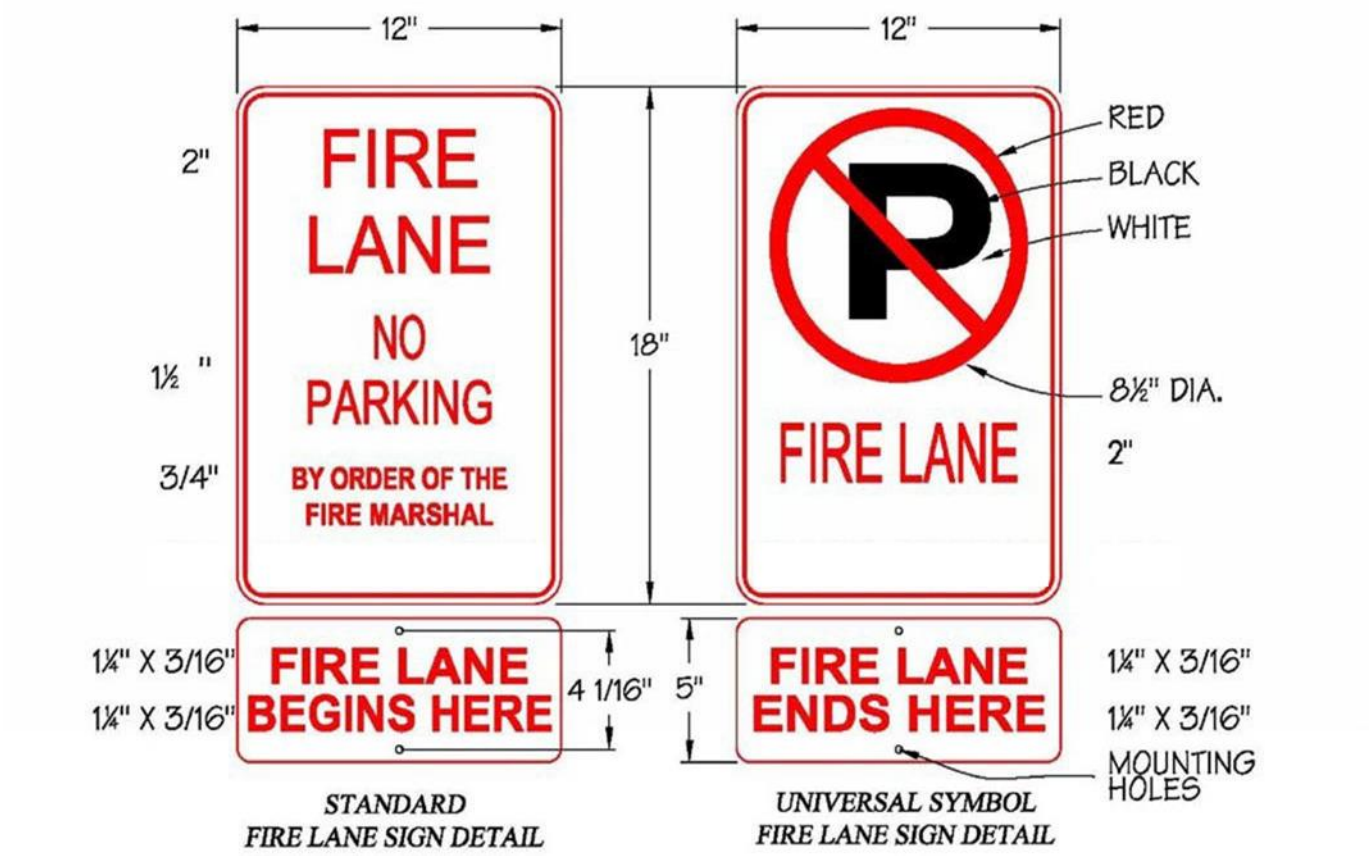


STANDARD FIRE LANE SIGN DETAIL

UNIVERSAL SYMBOL FIRE LANE SIGN DETAIL

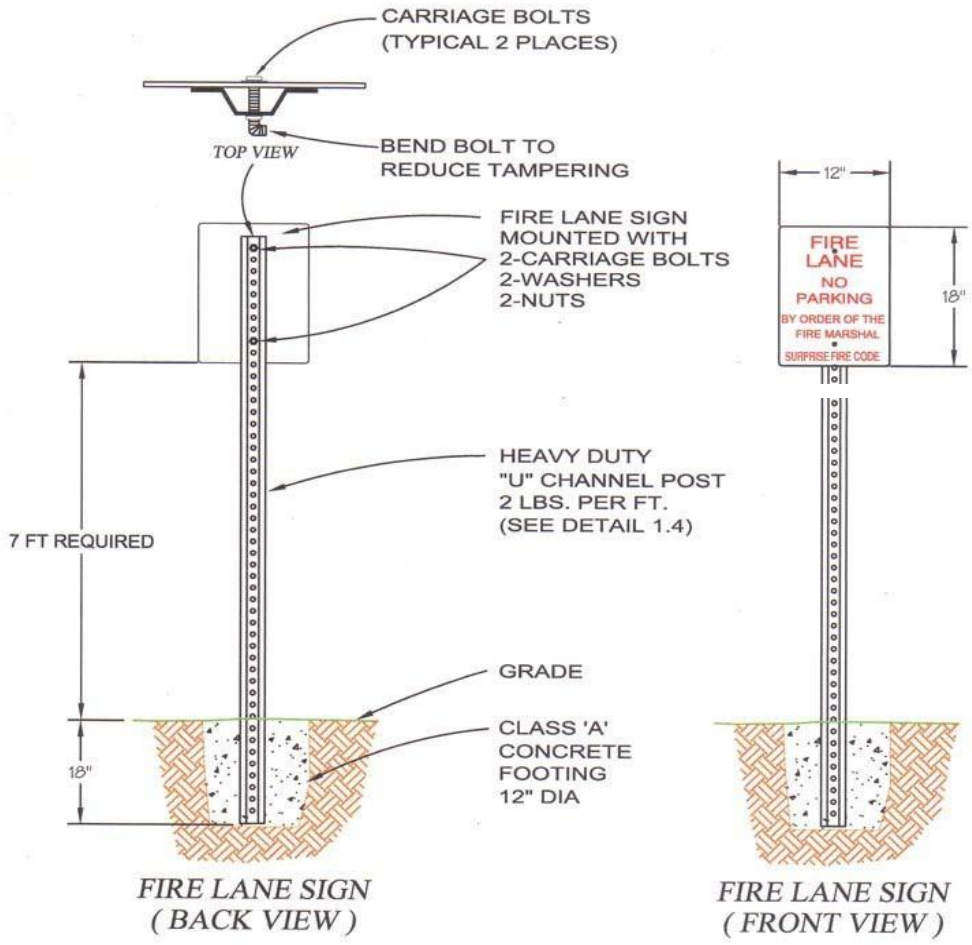
1. The sign plate shall be a minimum of 12 X 18 inches with a thickness of .080 aluminum construction.
2. The sign face shall have a white reflective background with a red legend. Use the standard 3M Scotchlite sign face number R7-32 or equivalent, with red screen printed lettering as shown above.

ALTERNATIVE FIRE LANE SIGNS



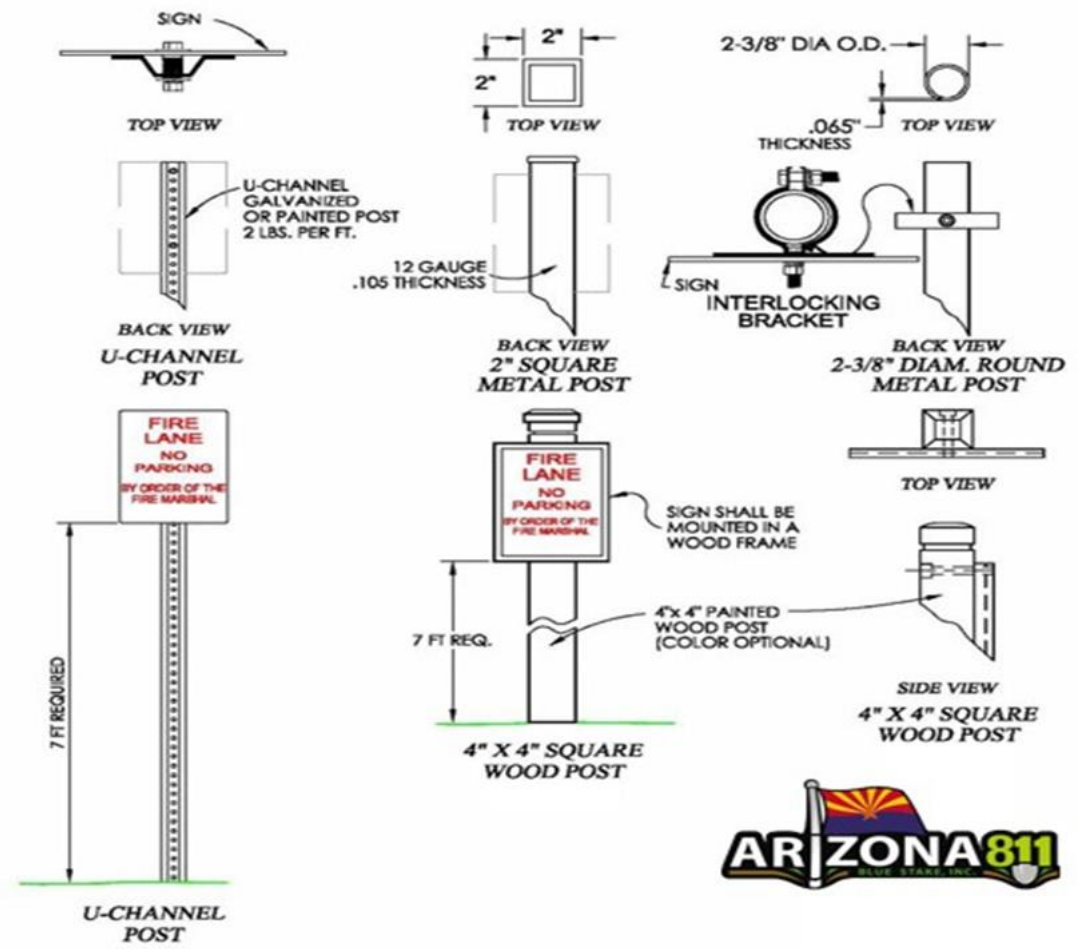
1. The sign plate shall be a minimum of 12 X 18 inches with a thickness of .080 aluminum construction.
2. The sign face shall have a white reflective background with a red legend. Use the standard 3M Scotchlite sign face number R7-32 or equivalent, with red screen printed lettering as shown above.

FIRE LANE SIGN AND POST INSTALLATION SPECIFICATIONS



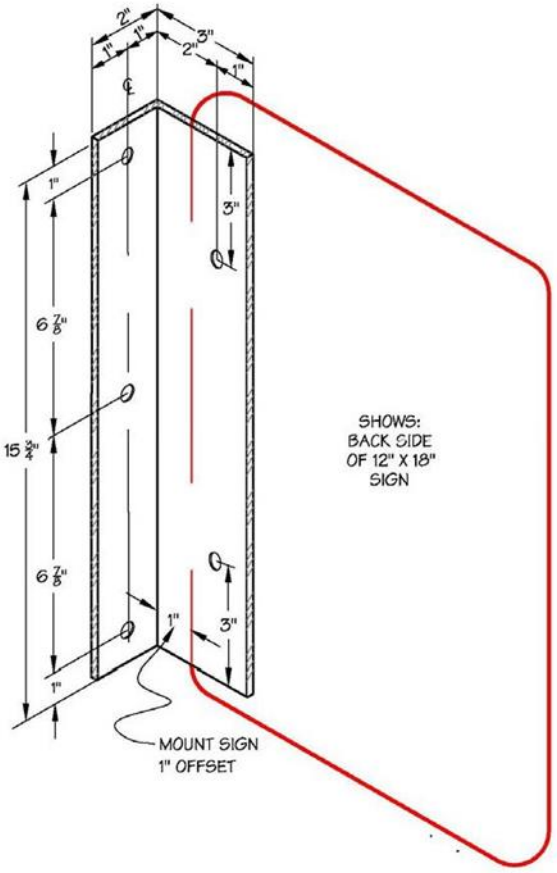
1. 10-foot long U-Channel galvanized or painted post.
2. Lane sign (12x18 inch) .80 aluminum construction with white reflective background and red screen-printed legend.
3. The sign plate shall be a minimum of 12 X 18 inches. The sign face shall have a white reflective background with a red legend. A durable, weather-proof sign shall be used.
4. Signs must face the direction of ONCOMING TRAFFIC.
5. Post shall be installed 12 to 18 inches from back of curb or back of sidewalk.
6. Corona de Tucson Fire District recommends you blue stake before you dig.

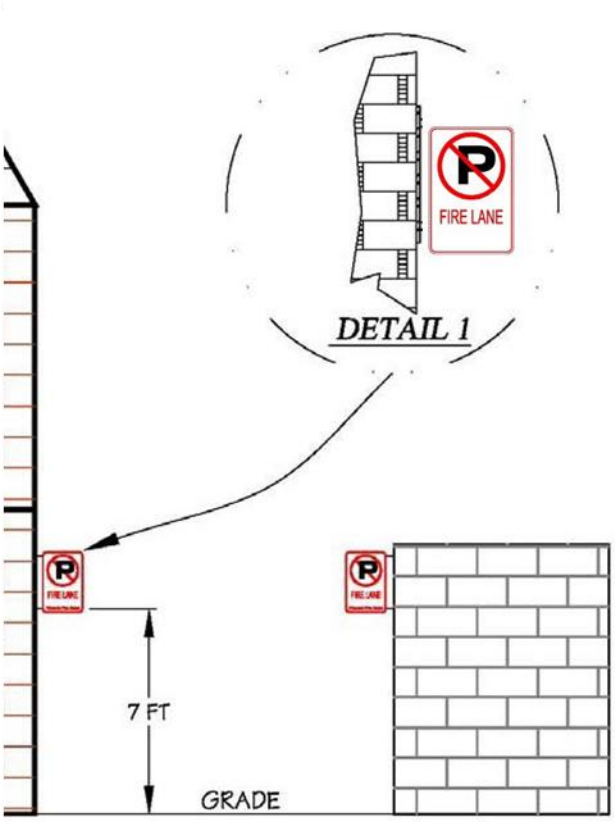
APPROVED FIRE LANE SIGNPOSTS



1. Approved signs shall be constructed of .080 aluminum with a reflective background.
2. Minimum of ¼" bolts with flat washers and nuts that bolt through.
3. Post footing shall be 12 inches in diameter and 18 inches in depth.
4. The sign shall be located seven (7) feet above finished grade to the bottom of sign.
5. Fire lane sign shall be installed 12 to 18 inches from back of curb or back of sidewalk.
6. Signs must face the direction of ONCOMING TRAFFIC.
7. Corona de Tucson Fire District recommends you blue stake before you dig.

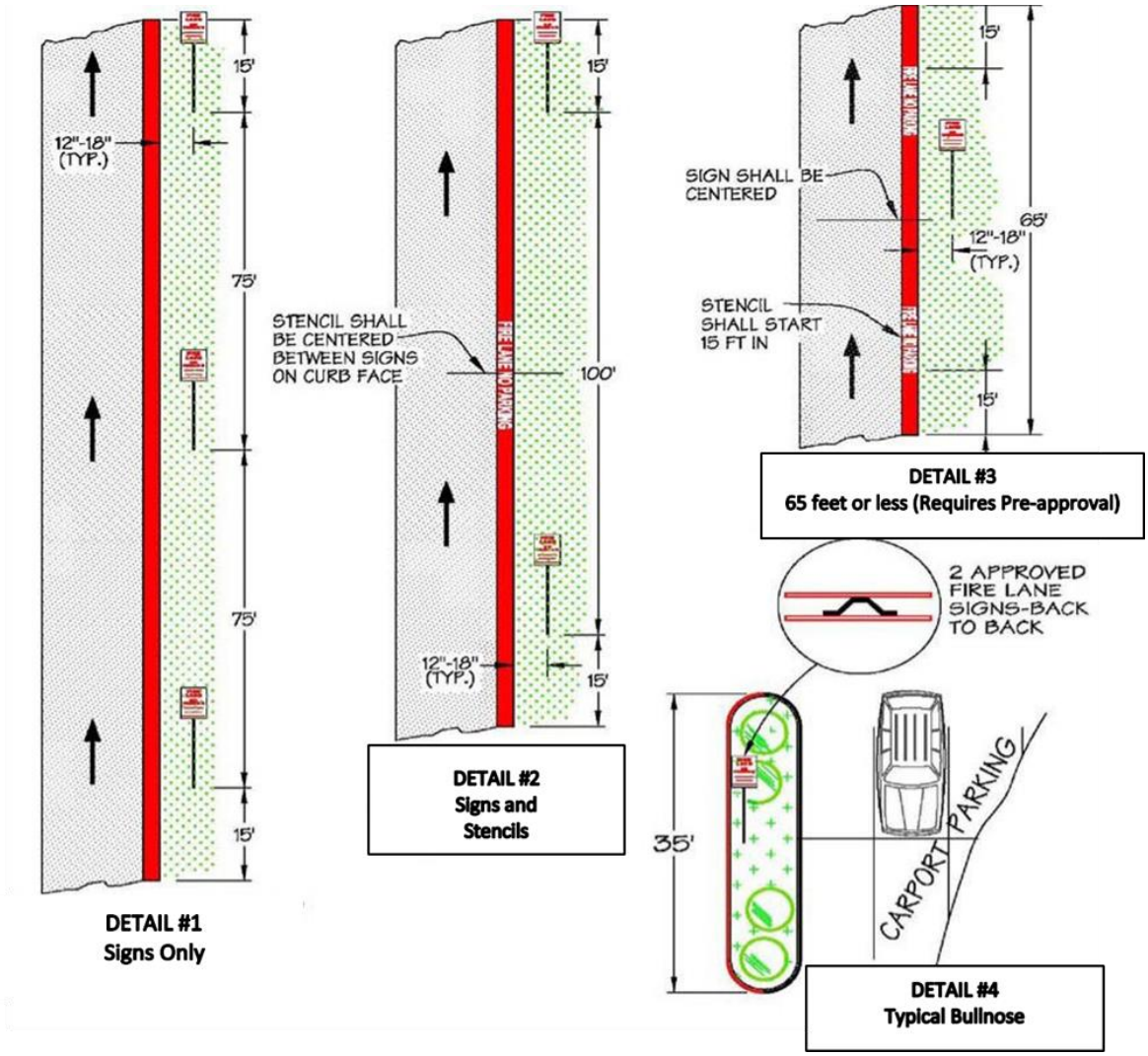
WALL MOUNT BRACKET FIRE LANE SIGN "FLAG-MOUNT STYLE"





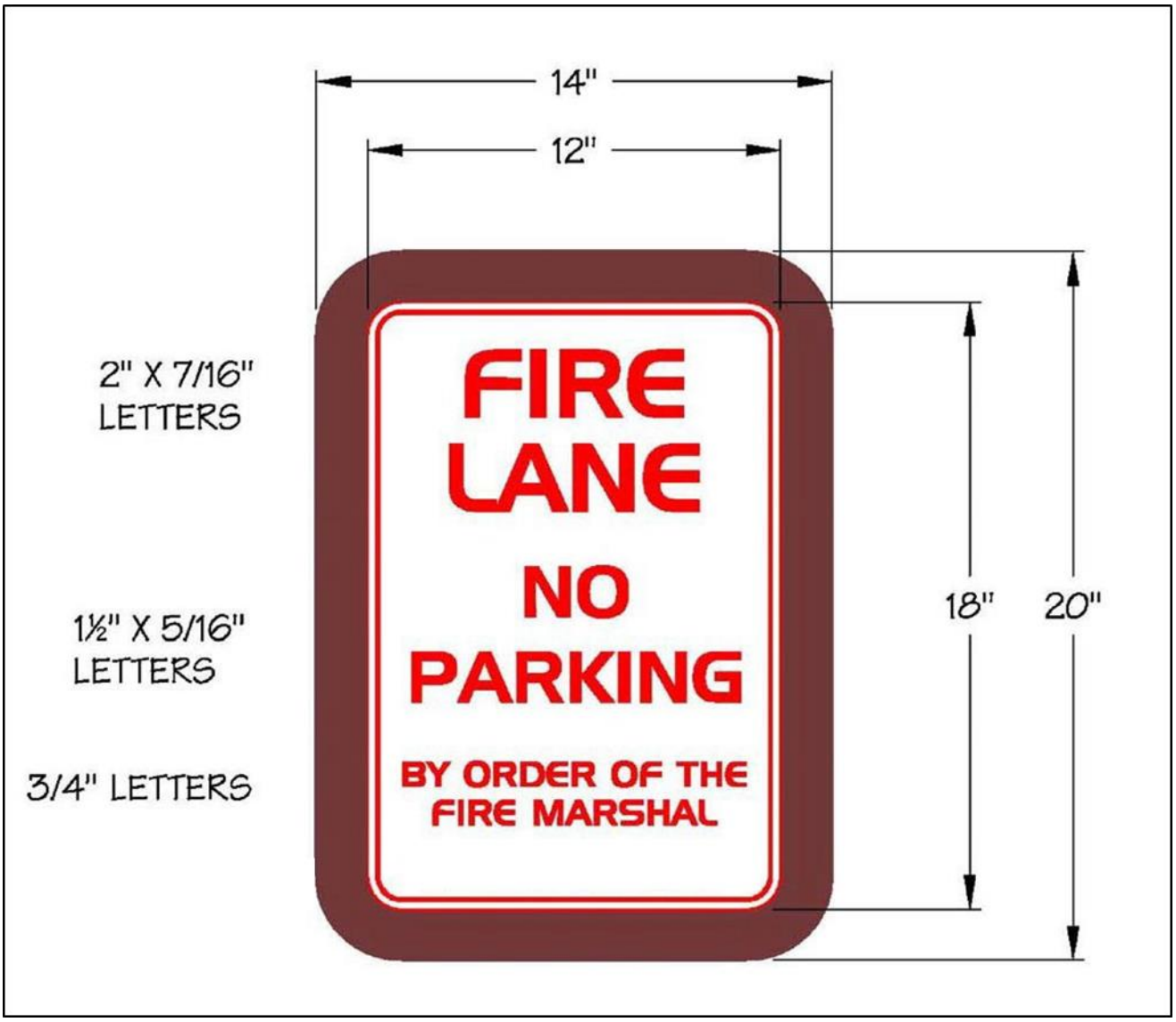
1. 3/16-inch-thick, 2X3X15¾ inch aluminum angle bracket.
2. The sign plate shall be a minimum of 12x18 inches with a thickness of .080 aluminum construction.
3. Approved sign bracket is available for flag-mounted FD access signs. Bracket can be used on either the right or left side of the sign.
4. This application only available when sign cannot be installed on an approved post.

FIRE LANE IDENTIFICATION, STENCILING AND SIGN INSTALLATION



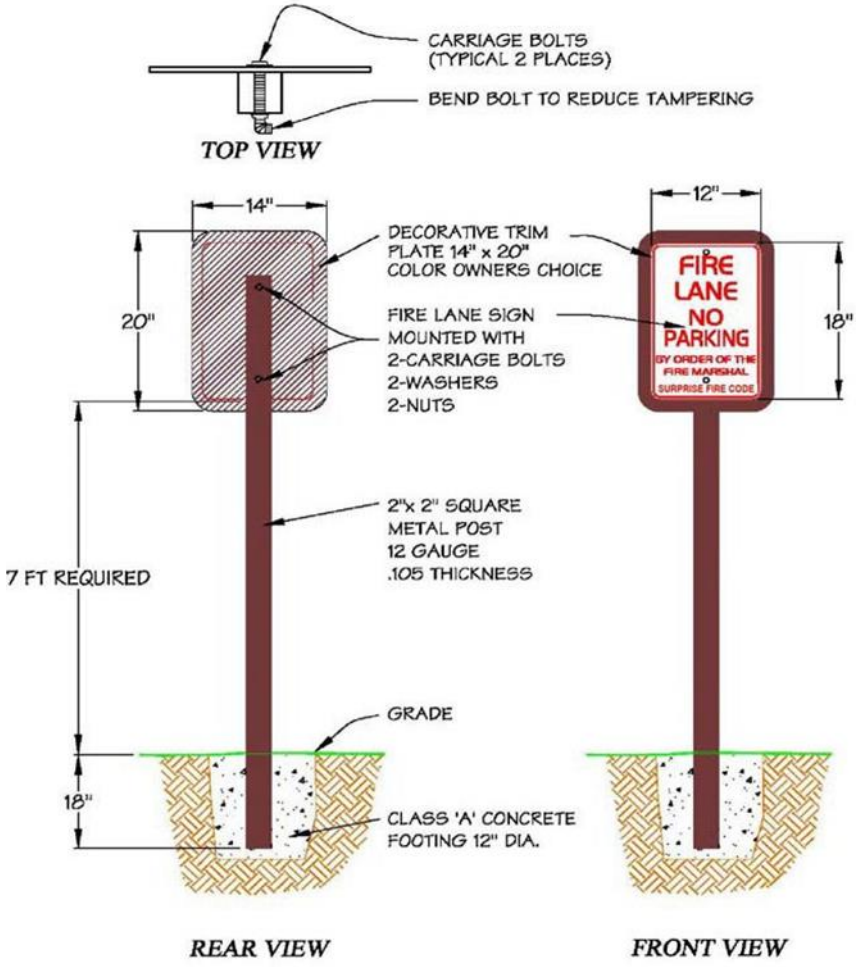
1. Approved fire lane signs shall be installed 12 to 18 inches from back of curb or back of sidewalk.
2. Sign must face the direction of ONCOMING TRAFFIC.
3. Stencils shall be in white lettering (4-inch height, ½ inch stroke) on “Industrial grade” safety red painted curb.
4. Stencil shall read “Fire Lane No Parking.”

DESIGNER FIRE LANE SIGNS



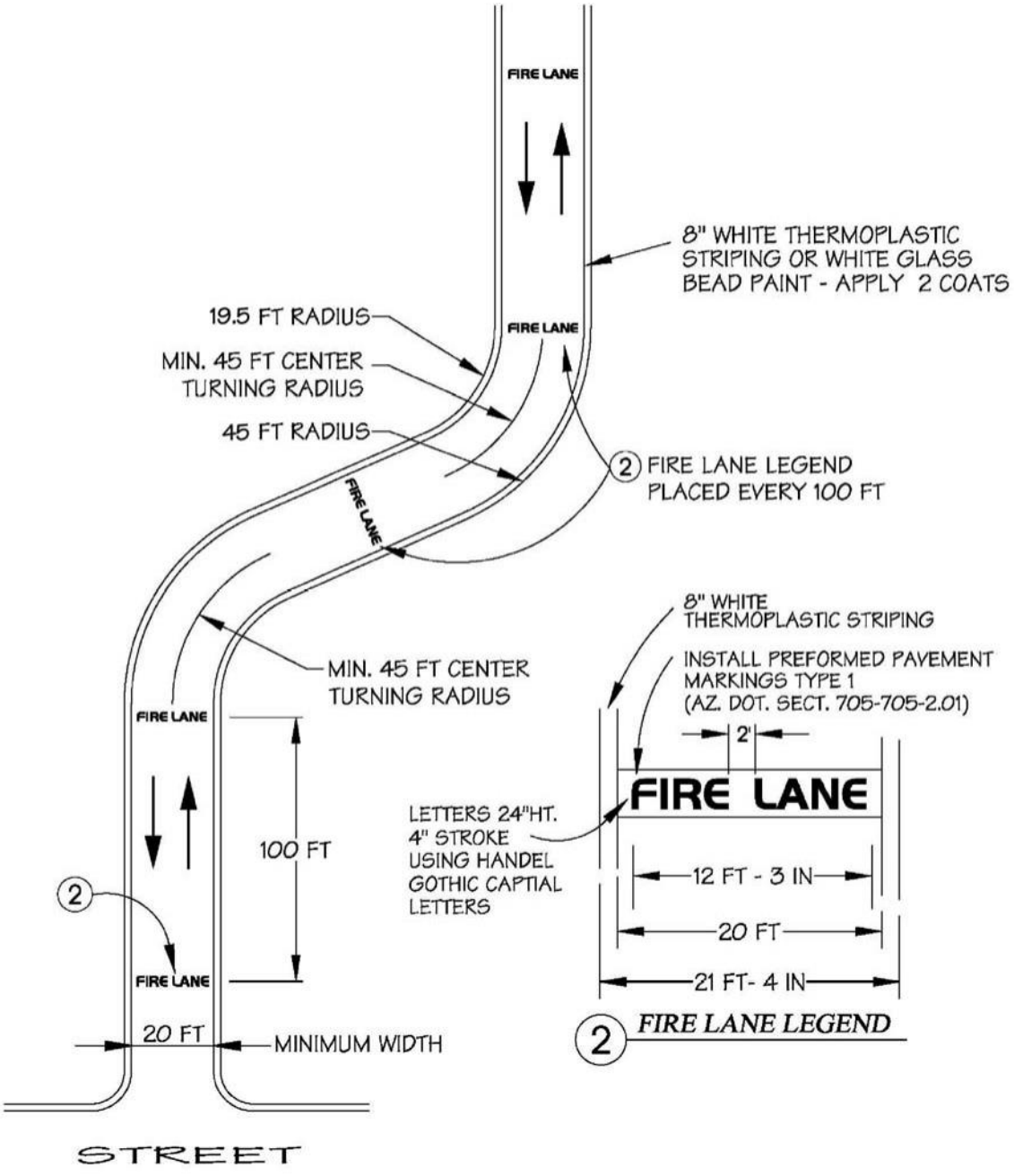
1. The sign plate shall be a minimum of 12 x 18 inches with a thickness of .080 aluminum construction.
2. The sign face shall have a white reflective background with a red legend. Use the standard 3M Scotchlite sign face number R7-32 or equivalent, with red screen-printed lettering as shown above.
3. Font style is Handel Gothic capital font.
4. Decorative trim plate shall be 14 x 20 inches with a thickness of .080 aluminum, in a color of the owner's choice.

DESIGNER FIRE LANE SIGNPOST 7 INSTALLATION

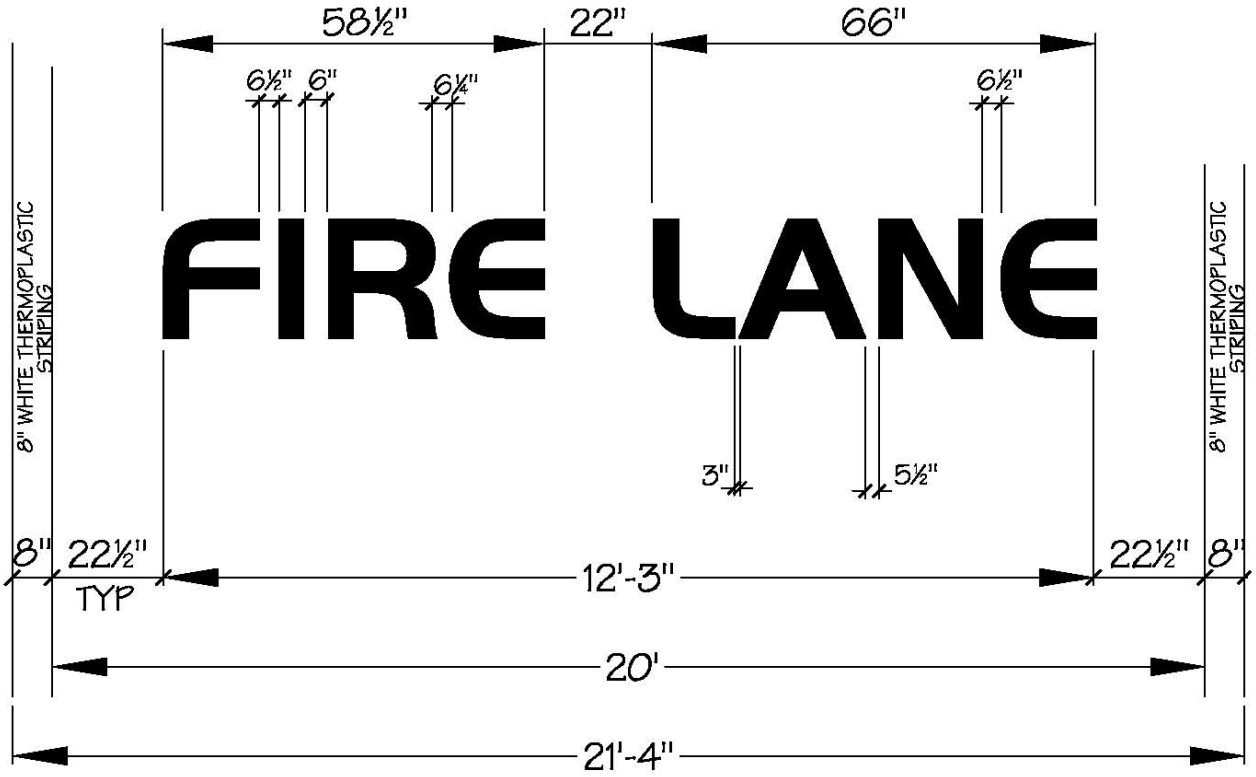


1. The sign plate shall be 12 x 18 inches with a thickness of .080 aluminum construction.
2. The sign face shall have a white reflective background with red screen-printed legend.
3. Letters using a Handel Gothic capital font.
4. Decorative trim plate shall be 14x20 inches with a thickness of .080 aluminum, color can be owner's choice.
5. Ten-foot long painted 2x2 inch square or round post shall be installed 12 to 18 inches from back of curb or back of sidewalk.
6. The sign shall be located seven (7) feet above finished grade to bottom of the sign.
7. Minimum of ¼" bolt with flat washers and nuts that bolt through post.
8. Signs must face the direction of ONCOMING TRAFFIC.
9. Corona de Tucson Fire District recommends you blue stake before you dig.

ALTERNATIVE FIRE LANE MARKING SYSTEM

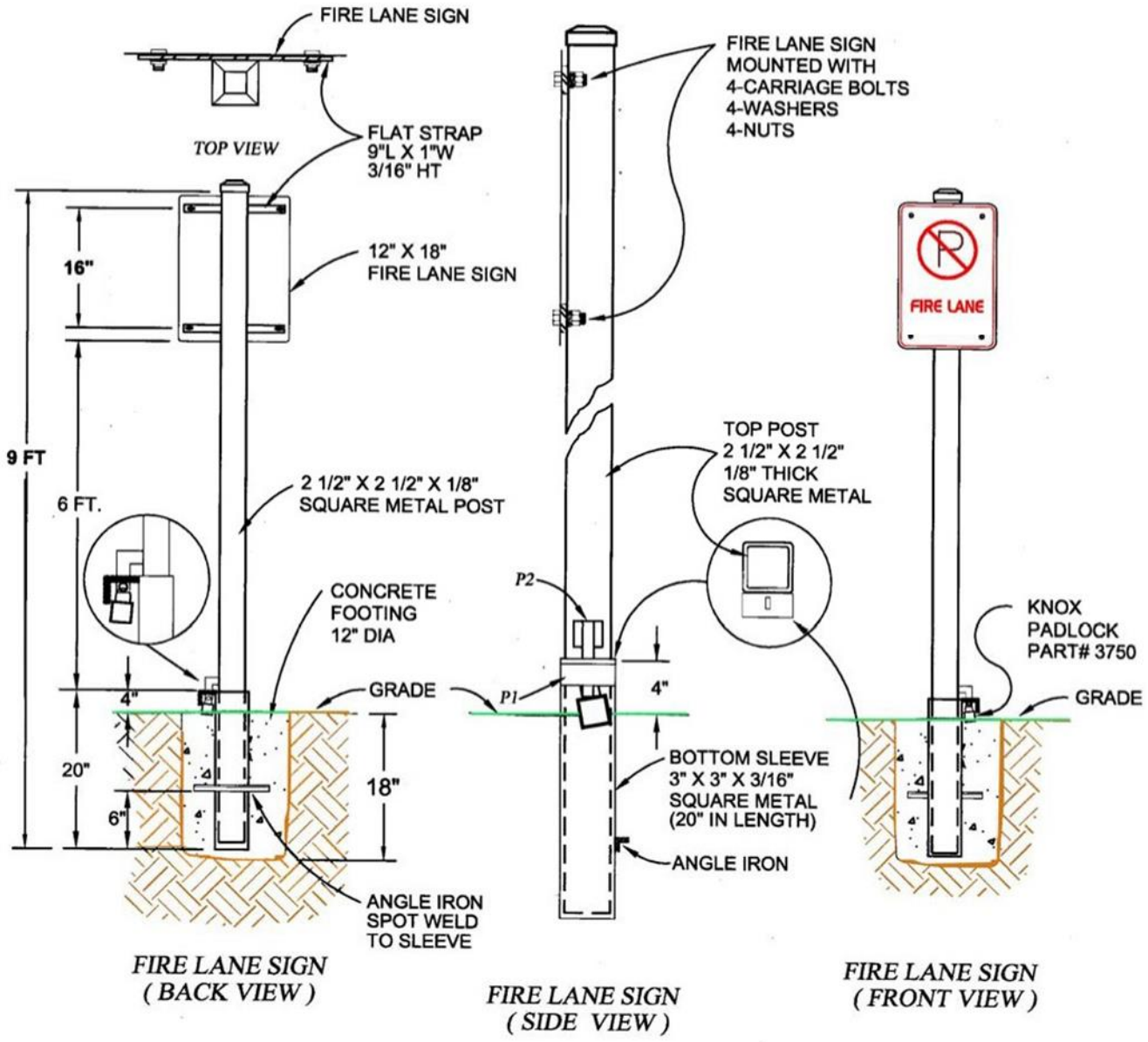


ALTERNATIVE FIRE LANE MARKING SYSTEM

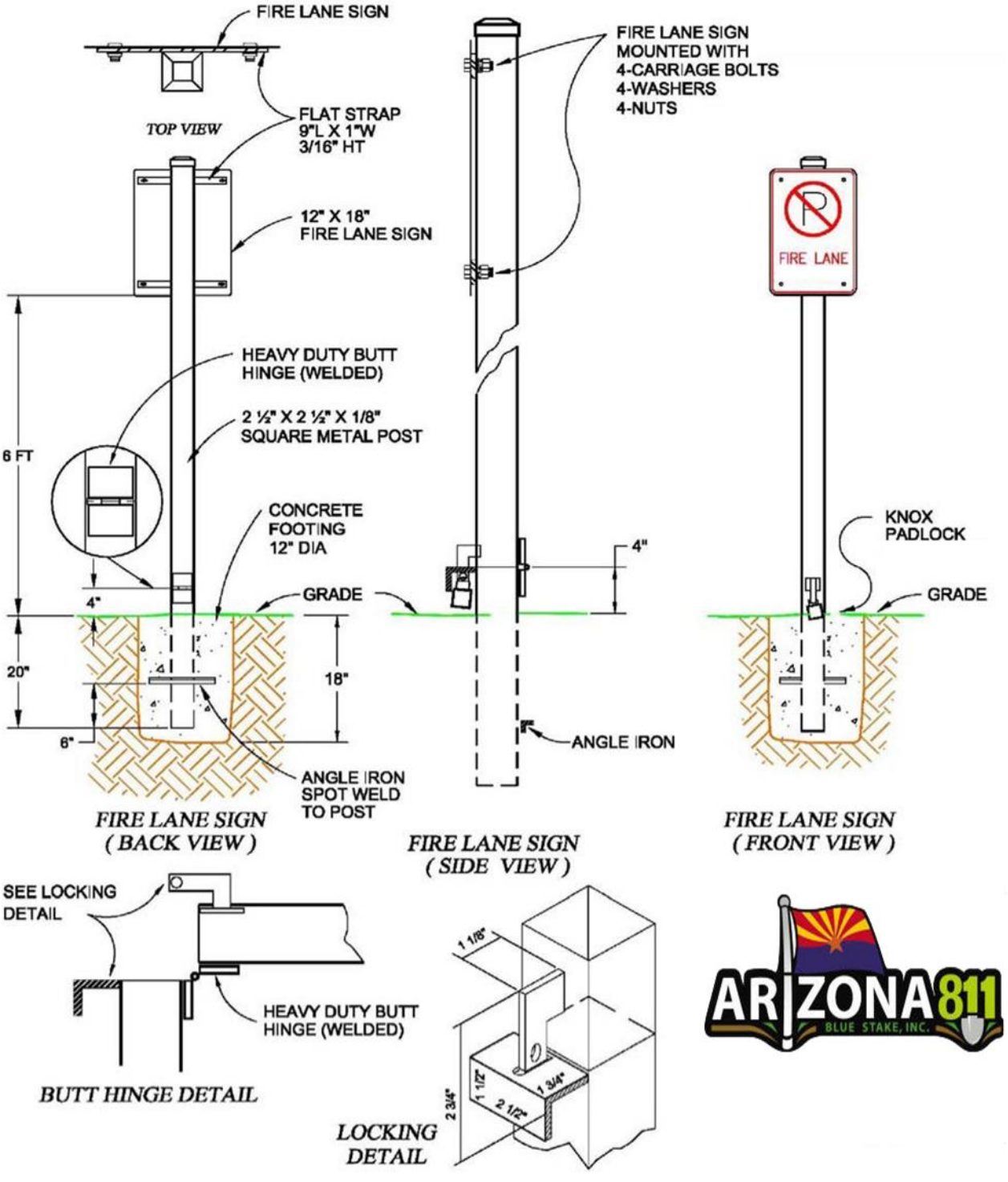


1. Letters 24-inch height with a three (3) inch stroke
2. Install performed pavement markings type I (AZ, DOT sect.705-705-0201).

REMOVEABLE FIRE LANE SIGN



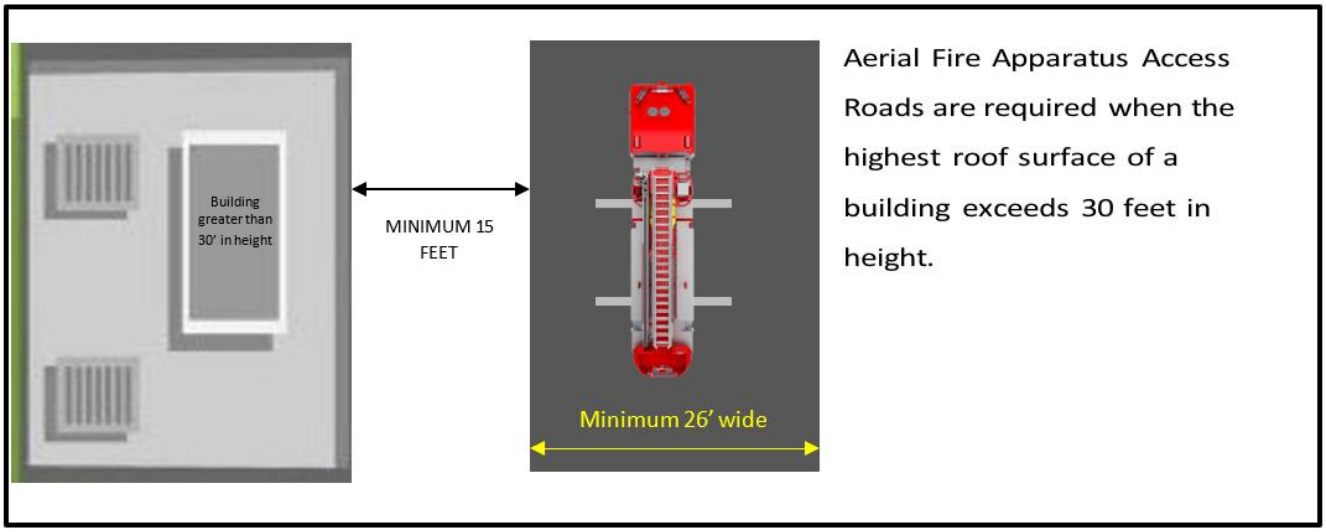
FOLDING FIRE LANE SIGN

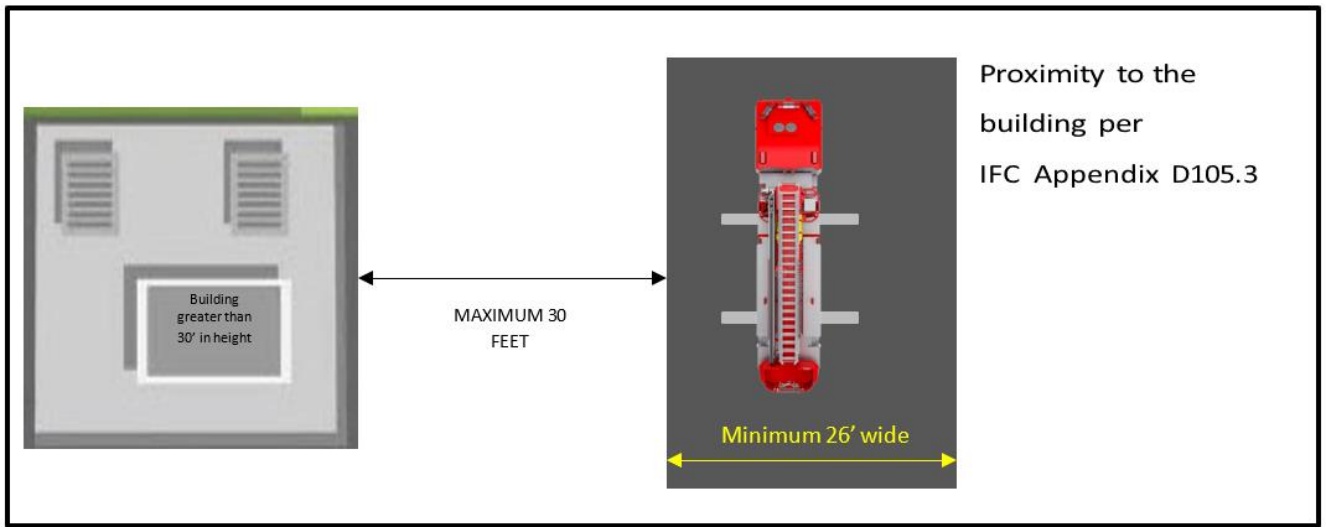


ALTERNATIVE SURFACE FIRE LANE MARKING
SOFT SURFACE



STANDARD AERIAL
FIRE APPARATUS ACCESS ROAD
FOR BUILDINGS
GREATER THAN 30' IN HEIGHT





The side of the building on which the aerial apparatus access road is positioned shall be approved by the Fire Code Official.

REFLECTIVE BLUE MARKER INSTALLATION DETAIL



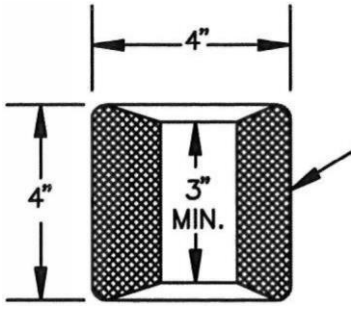


Reflective area is 3.25 square inches per reflective face.

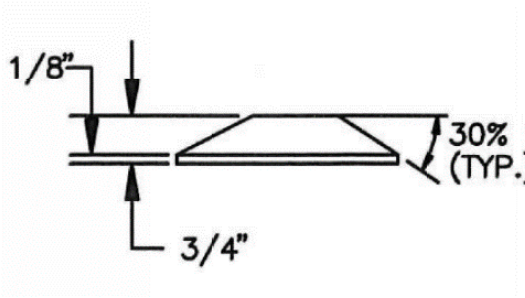


MATERIALS

Acrylic plastic reflector filled with a tightly adherent potting compound.



PRISMATIC REFLECTOR
(One side only for one-way traffic)



Elevation View

1. Blue/red reflectors are required to help identify the location of fire hydrants and fire department connections (FDC) in the dark.
2. Blue reflectors shall be placed one (1) foot off the center line of the street or lane toward the hydrant or FDC.
3. One (1) blue marker is required to identify a fire hydrant.
4. One (1) red marker is required to identify an FDC.

CHAPTER THREE

Fire Department Signage

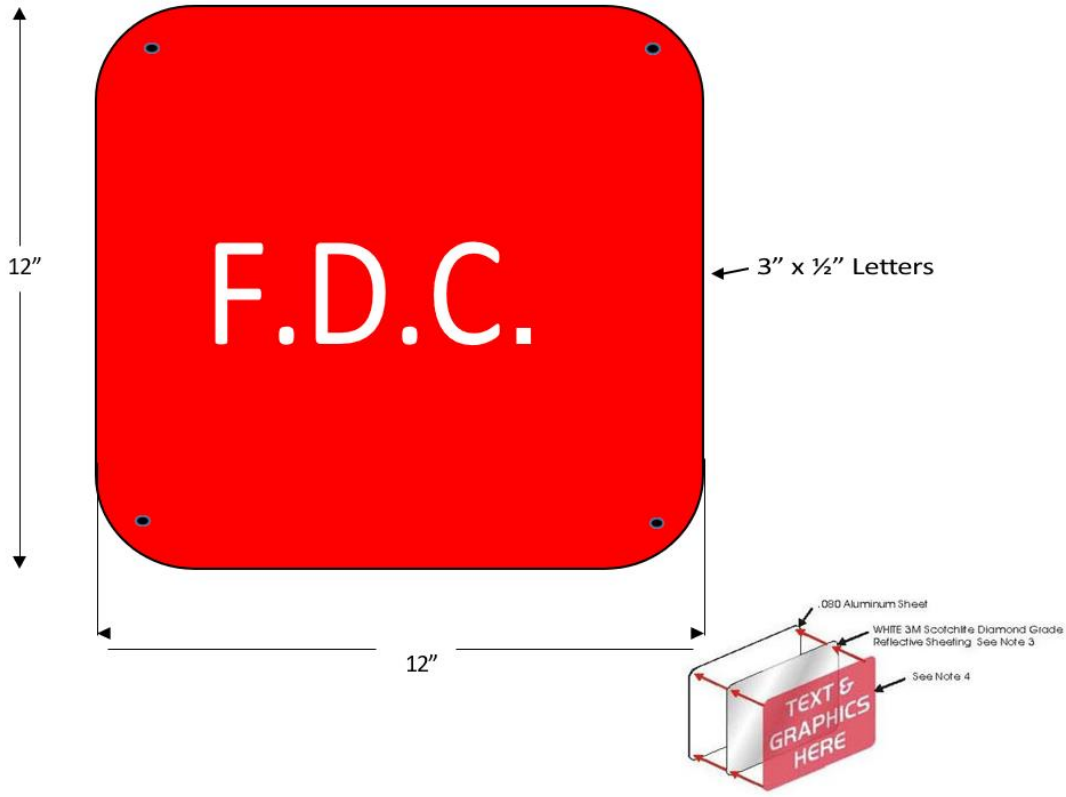
Contents:

- Fire Department Connection (FDC) Signage
- Sprinkler Riser Room Signage
- FACP Signage
- Fire Protection System Signage
- Fire Department Command Center Signage

Purpose:

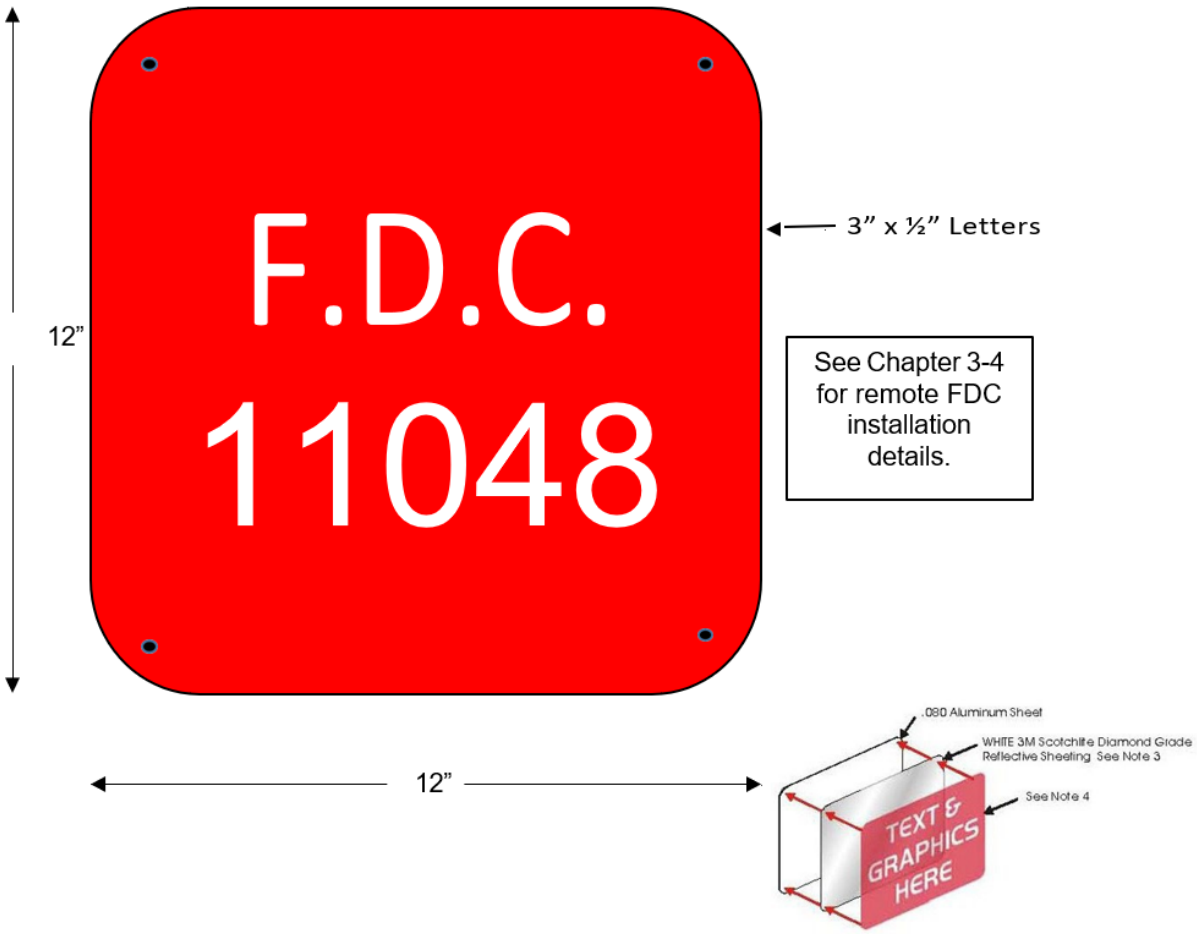
Properly identified fire protection systems will enable Firefighters to more efficiently do their job. This means a better outcome for the property owner.

FDC SIGN DETAIL



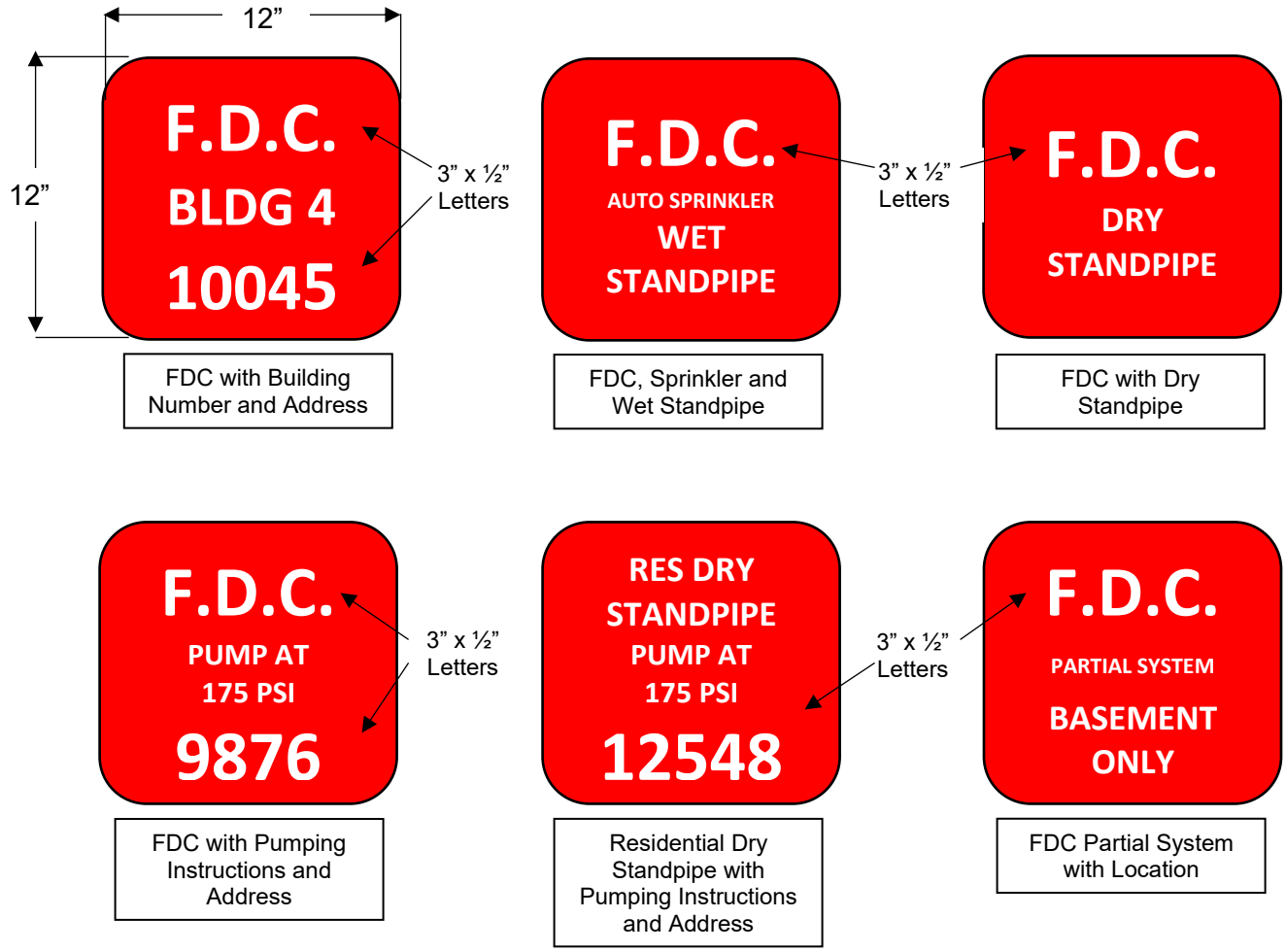
1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.
4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.
5. Sign to be installed on the wall over the FDC valve, above the FDC and clearly visible from the roadway.

FDC SIGN WITH ADDRESS NUMBERS DETAIL

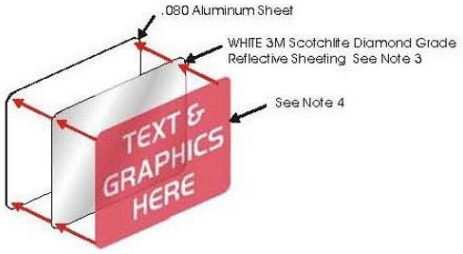


1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. The sign plate shall be a minimum size of 12 x 12 inches with a thickness of .080 aluminum construction.
3. Font style is Handel Gothic capital font.
4. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.
5. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

ALTERNATE FDC SIGN DETAILS

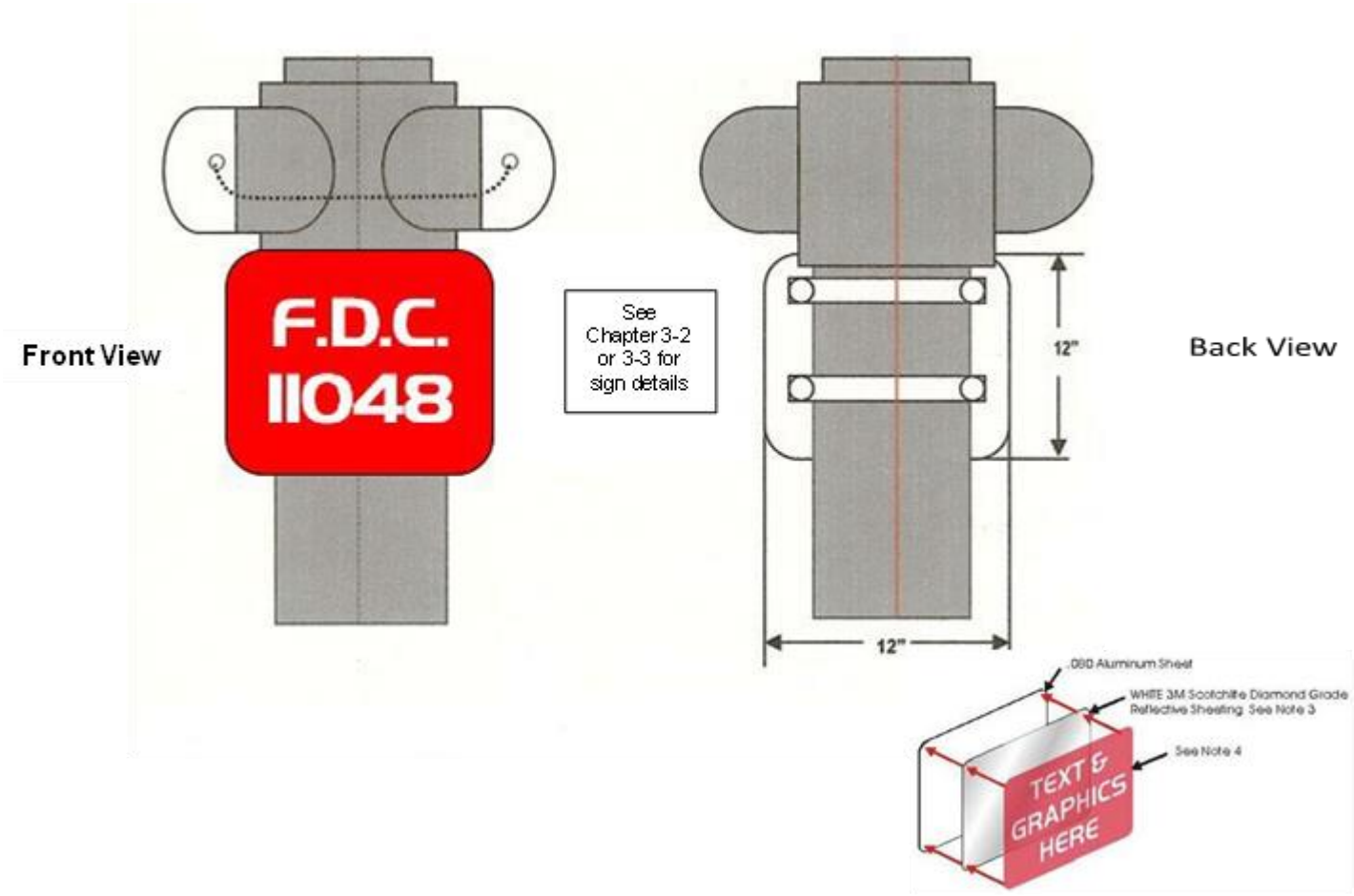


1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.



4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

REMOTE FDC SIGN INSTALLATION



1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Two mounting straps with nut and bolt fasteners.
3. Font style is Handel Gothic capital fonts.
4. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.
5. Lettering graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

FDC SIGN EXAMPLES

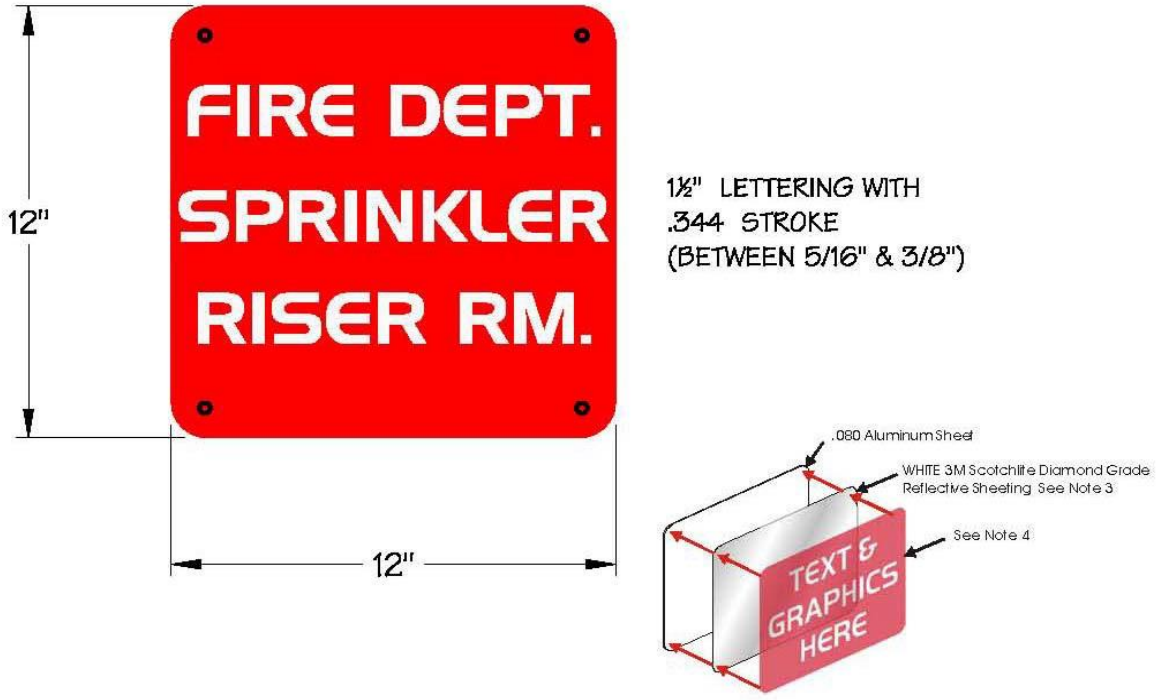






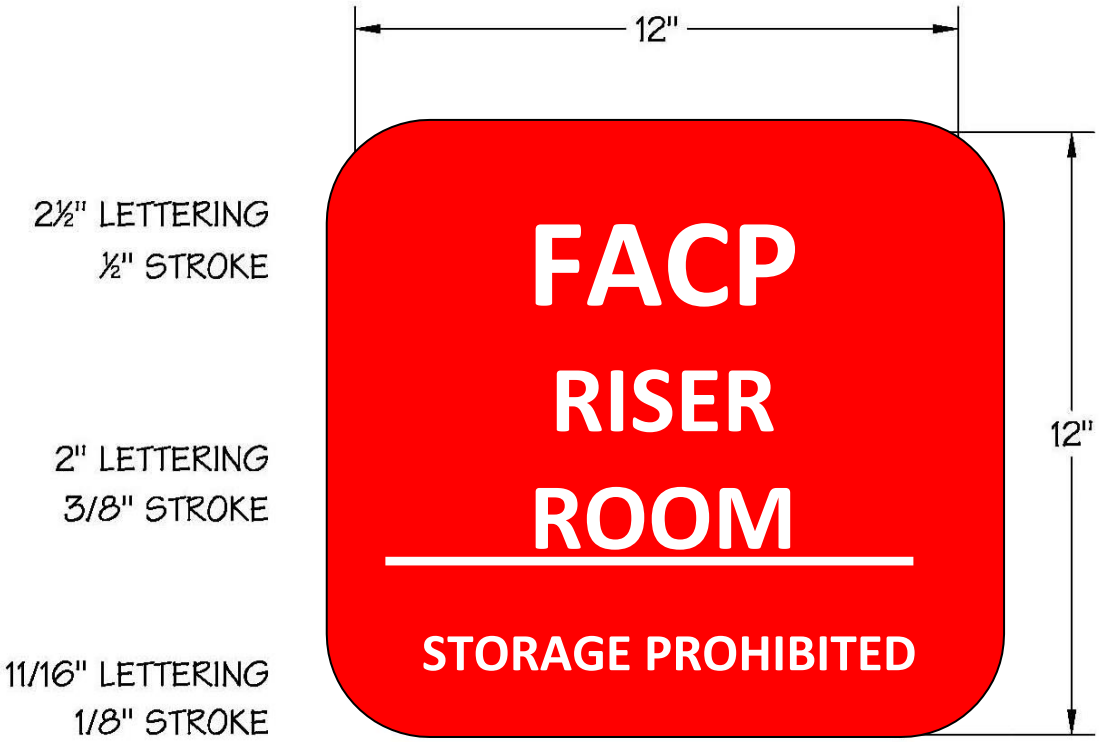


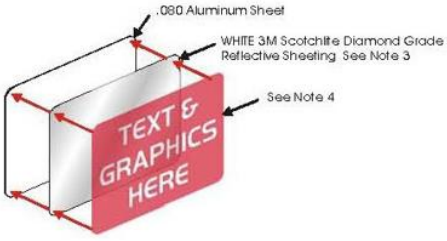
FIRE DEPARTMENT SPRINKLER RISER ROOM SIGN



1. The sign plate shall be a minimum size of 12x12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

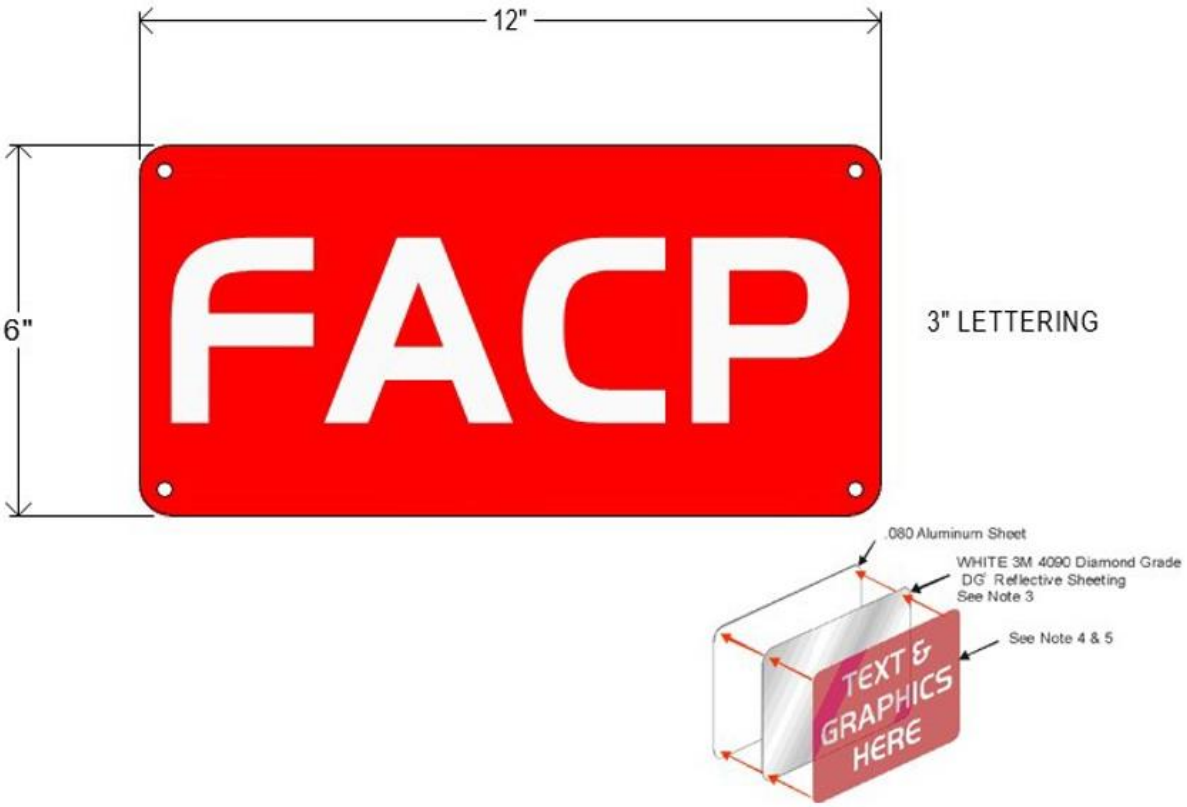
FACP & RISER ROOM IDENTIFICATION SIGN DETAIL





1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting 3990 series VIP, type IX) applied as a background.
4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

EXTERIOR FACP IDENTIFICATION SIGN DETAIL



1. The sign plate shall be a minimum size of 12X6 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.
4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

INTERIOR FIRE ALARM CONTROL PANEL SIGNAGE

Signage identifying Fire Alarm Control Panel (FACP) locations inside buildings may be installed in in a style consistent with other signage installed in the building.





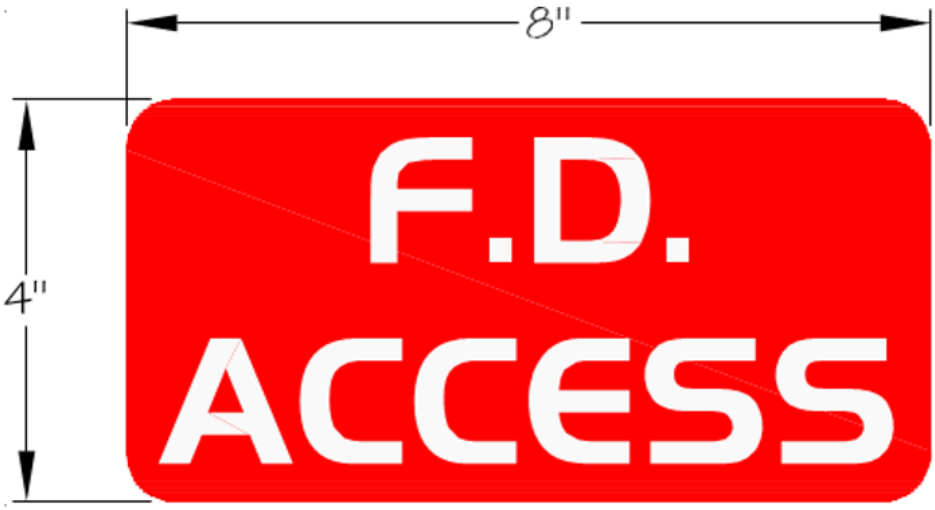








FIRE DEPARTMENT ACCESS SIGN DETAIL

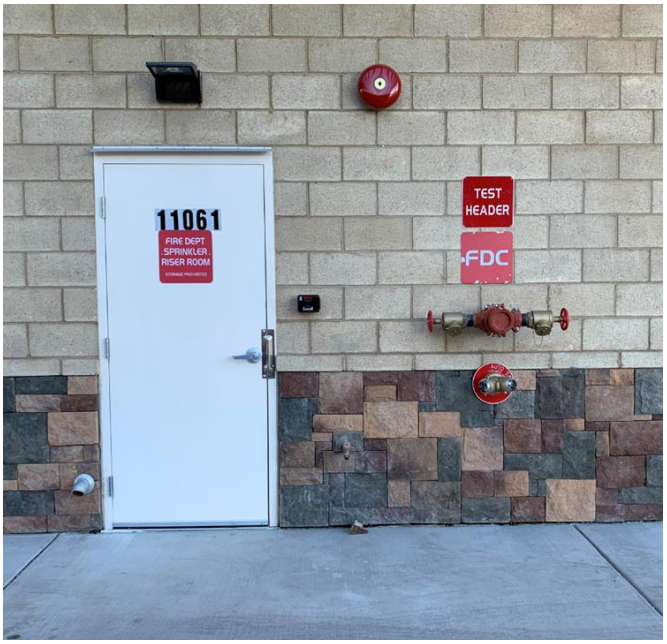


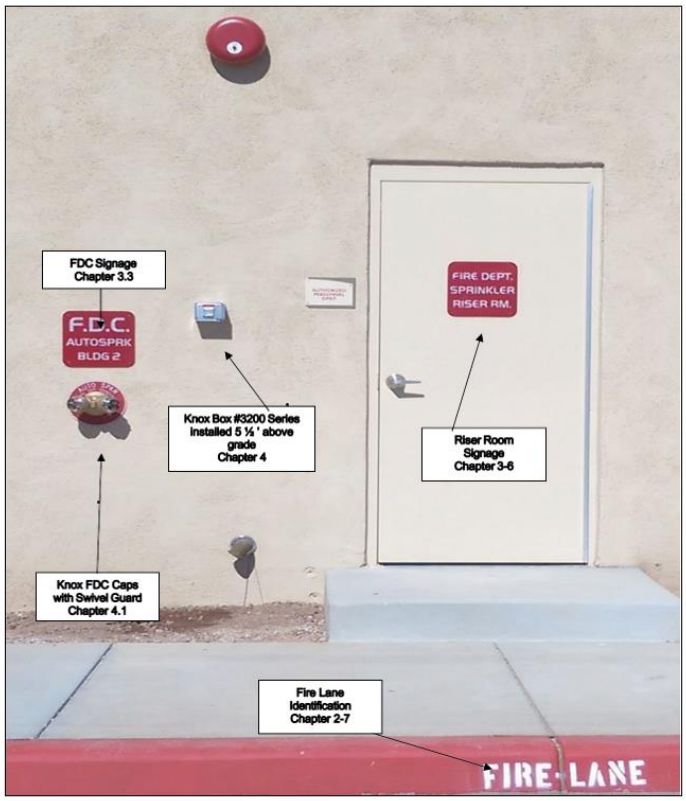
This sign is typically used with gates. See Chapter 6: Automatic Electric Gates and Chapter 7: Manual and Pedestrian Gates for sign placement.



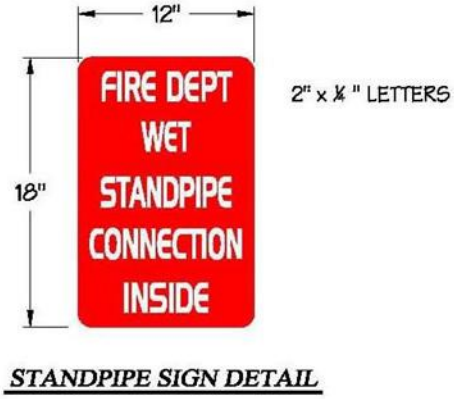
1. The sign plate shall be a minimum size of 8x4 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting (3990 series VIP, type IX) applied as a background.
4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

FDC, RISER ROOM, KNOX BOX EXAMPLE

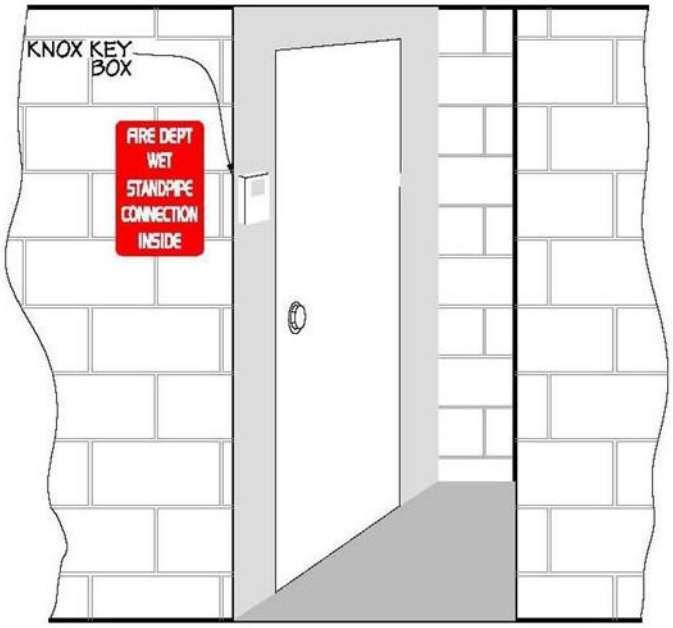


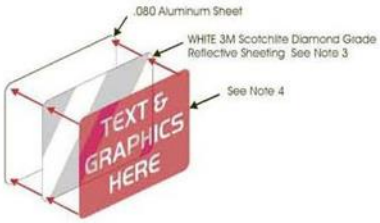


WET STANDPIPE SIGN DETAIL



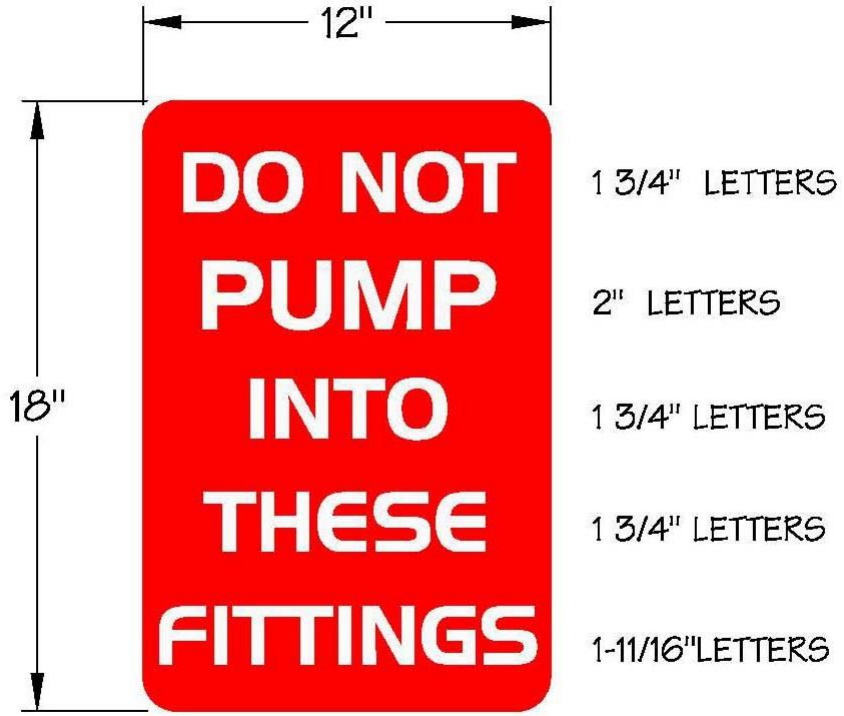
STANDPIPE SIGN DETAIL





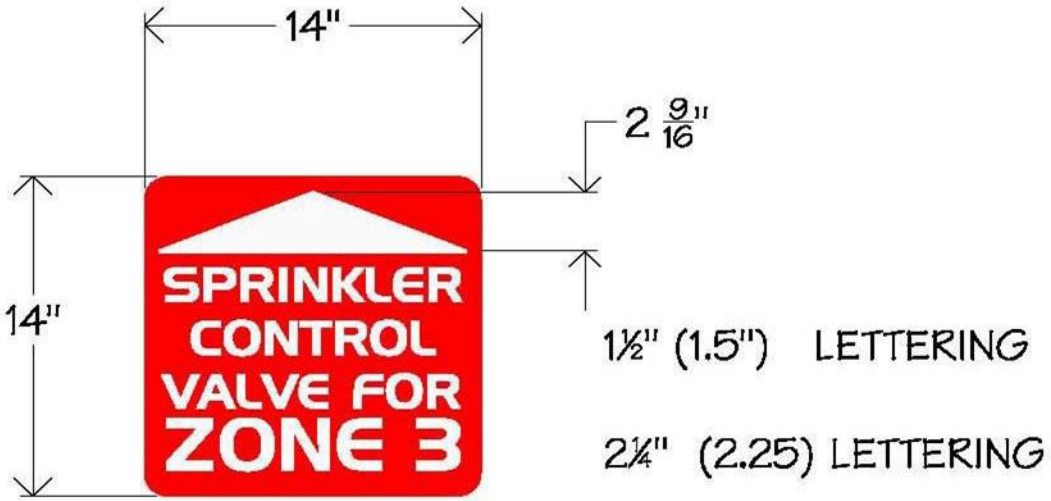
1. The sign plate shall be 12X18 inches and fabricated from
2. .080 aluminum sheet with 1½ inch radius corners.
3. Font style is Handel Gothic capital fonts.
4. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
5. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series traffic sign red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.
6. Install KNOX BOX SERIES #3200 next to lock on Fire Department access door. See Chapter 4-1 for Knox box ordering information.

SPECIAL FIRE DEPARTMENT FIRE PUMP TEST HEADER SIGN DETAIL



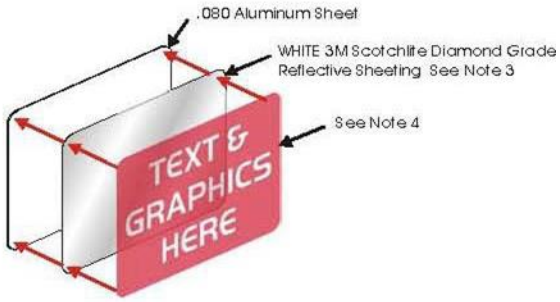
1. The sign plate shall be a minimum size of 12X18 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.
5. Additional kerning between letters as shown.
6. Mount on four corners.

SPRINKLER CONTROL VALVE FOR ZONE APPLICATIONS SIGN DETAIL



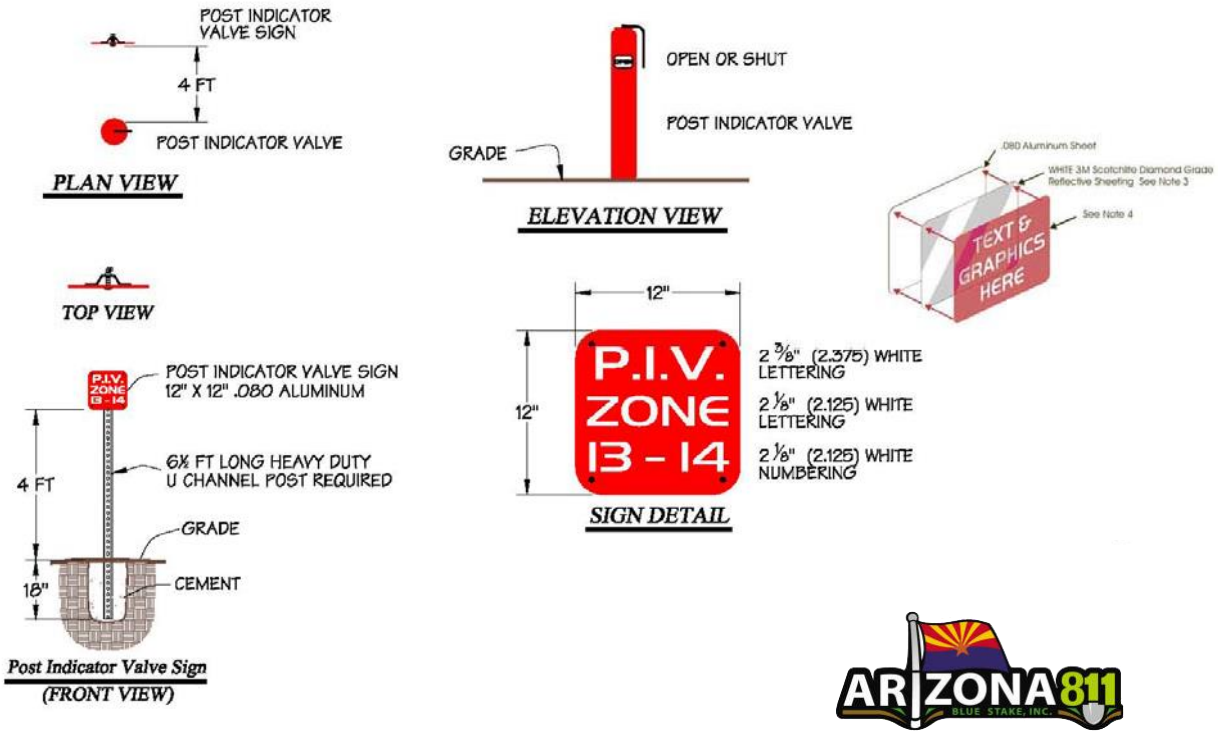
SPRINKLER VALVE SIGN

Serves Floors 1 thru 4



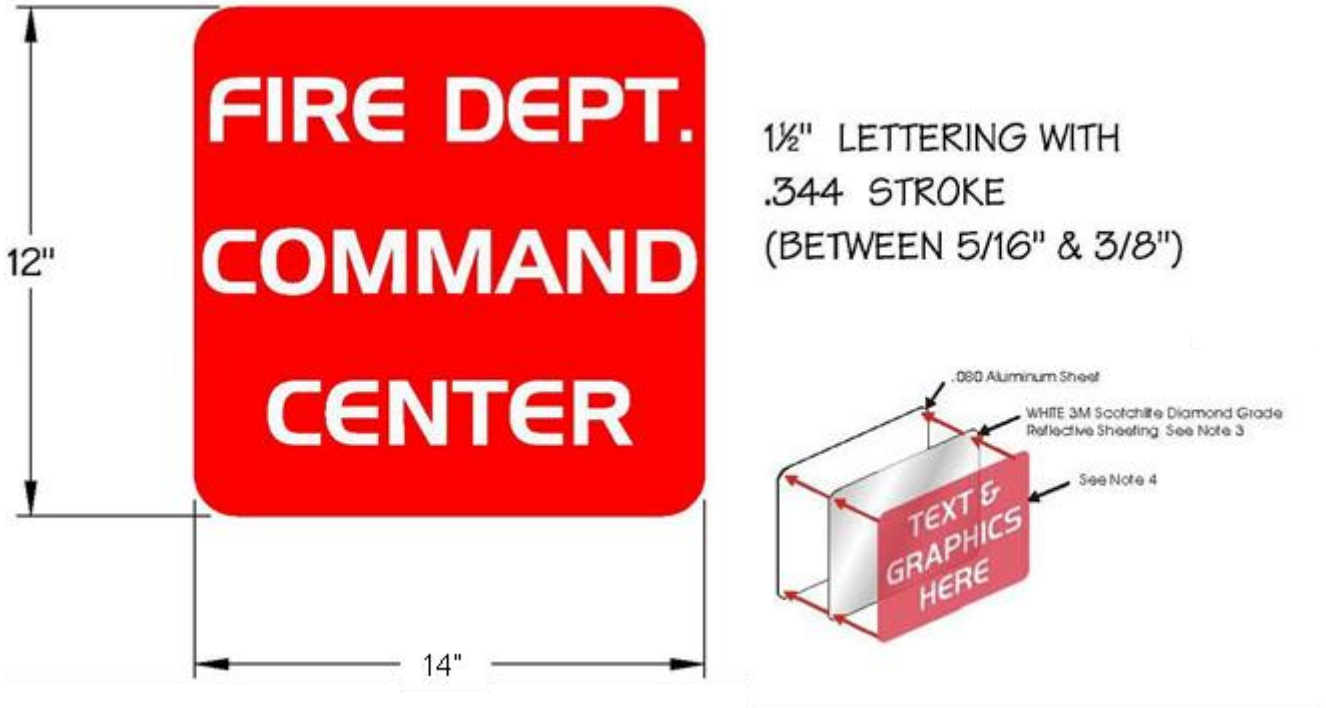
1. The sign plate shall be a minimum size of 14x14 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series traffic sign red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

POST INDICATOR VALVE SIGN DETAIL



1. The sign plate shall be 12x12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series traffic sign red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

FIRE DEPARTMENT COMMAND CENTER SIGN DETAIL



1. The sign plate shall be 12x14 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series traffic sign red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.

FIRE DEPARTMENT COMMAND CENTER SIGN WITH KNOX BOX EXAMPLES



CHAPTER FOUR

Knox Boxes, Switches, Etc.

Contents:

- Knox Boxes, Locations and Installation Guide
- Key Switches
- Padlocks
- Fire Department Connection Plugs
- Elevator/Lobby Key Boxes

Purpose:

Proper location of lock boxes and key switches enables emergency responders to gain entry into secured buildings. This reduces or eliminates damage done to property and also reduces response times.

FIRE DEPARTMENT KNOX GUIDE FOR COMMERCIAL PROPERTIES

GENERAL NOTES FOR ALL COMMERCIAL PROPERTIES

- Knox boxes and other Knox products are available to order online at www.knoxbox.com. When prompted for a Fire Department, enter Corona de Tucson Fire in Tucson, AZ.
- All Knox boxes are required to be installed no more than 5 feet 6 inches above finished grade, as approved.
- Tamper switches are optional, not required, on all Knox boxes.
- A **KNOX BOX SERIES #3200** is required at any exterior riser room door located on the latch side of the door. Additional Knox boxes may be required by the Fire Code Official based upon property size, individual circumstances or special hazards.
- A **KNOX VAULT SERIES #4400** is to be installed on large, multi-tenant structures when required by the Fire Code Official.
- A **KNOX PADLOCK SERIES #3780** is to be installed on exterior manual main gates when required by the Fire Code Official. Padlock #3781 or #3782 is acceptable.
- A **KNOX ELEVATOR KEY BOX SERIES #1403** may be required in the lobby of each elevator bank at the lowest level of fire department access.
- **KNOX FDC PLUGS #3110 or with SWIVEL GUARD #3041** are required for all fire department connections.



Knox Series #3200



Knox Vault Series #4400



Knox Padlocks

KNOX BOX LOCATIONS

BIG BOX BUILDINGS

Example: Home Depot, Wal-Mart, etc.

- A **KNOX BOX SERIES #3200** is required at the exterior riser room door. Additional Knox boxes may be required by the Fire Code Official based upon property size, individual circumstances or special hazards.

STRIP MALLS

Example: single story, multi-suite exterior access

- A **KNOX BOX SERIES #3200** is required at exterior riser room doors. Additional Knox boxes may be required by the Fire Code Official based upon property size, individual circumstances or special hazards.
- Each tenant is required to provide and maintain the correct key(s) to their tenant space in the Knox box.

SPECIAL HAZARD OCCUPANCIES

- Any occupancy containing hazardous materials, operations or conditions must contact a Fire Inspector at 1-520-762-5007 for the required number and placement of Knox boxes.

OTHER APPLICATIONS

- **Electric, Automatic Gates** – KNOX KEY SWITCH SERIES #3501 is required for all electronically locked gates. Refer to **Chapter 6: Automatic Gates** for additional information.
- **Pedestrian Gates** – Primary access points that have pedestrian gates require Fire Department access. Access may be provided using a **KNOX KEY SWITCH SERIES #3501** for electric gates or a **KNOX BOX SERIES #3200** key box for manual gates. Refer to **Chapter 7: Manual Vehicle and Pedestrian Gates** for additional information.

Notice!

This information is intended to be used as a guide only. Fire Department access needs and requirements vary from property to property; therefore, it is required that a Fire Inspector inspect and approve all Knox box and key switch locations prior to installation.

BIG BOX RETAIL BUILDINGS



1. A **KNOX BOX SERIES #3200** is required at the **exterior riser room door.** Knox boxes shall be installed on the latch side of the door(s).
2. Additional Knox boxes may be required by the Fire Code Official based upon property size, individual circumstances or special hazards.
3. All Knox boxes are required to be installed no more than 5 feet 6 inches above finished grade, as approved.

STRIP MALLS



1. A KNOX BOX SERIES #3200 is required at exterior riser room doors. Knox boxes shall be installed on the latch side of the door(s).
2. Additional Knox boxes may be required at by the Fire Code Official based upon travel distances.
3. Each tenant is required to provide and maintain the correct key(s) to their tenant space in the Knox box.
4. All Knox boxes are required to be installed no more than 5 feet 6 inches above finished grade, as approved.

SMALL COMMERCIAL BUILDINGS



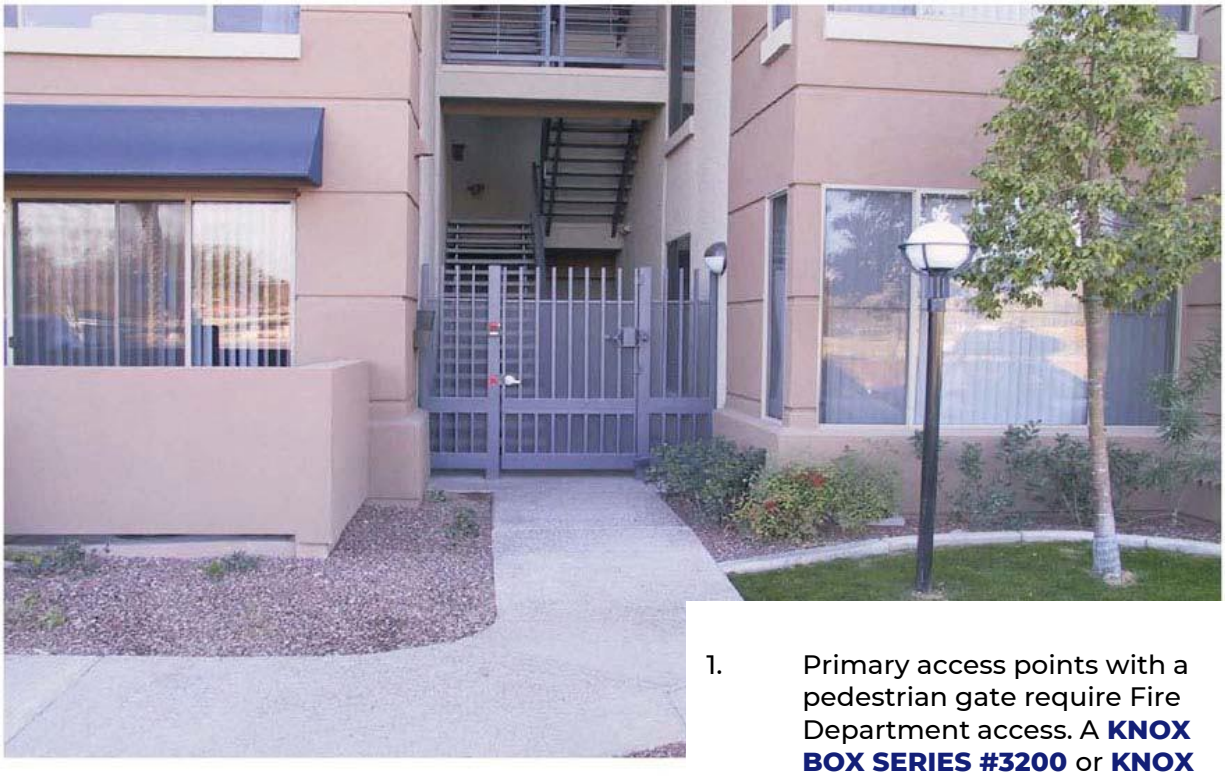
1. When provided with an automatic sprinkler system, a **KNOX BOX SERIES #3200** is required at the **exterior riser room door.** Knox boxes shall be installed on the latch side of the door.
2. In non-sprinklered buildings, a **KNOX BOX SERIES #3200** is required at the front entrance. Knox boxes shall be installed on the latch side of the door(s).
3. All Knox boxes are required to be installed no more than 5 feet 6 inches above finished grade, as approved.

HIGH RISE BUILDINGS



1. A **KNOX VAULT SERIES #3200 OR #4400** is required on the latch side of the **main entry door**.
2. A **KNOX BOX SERIES #3200** may be required at the **exterior riser room door**, depending on location of the room. Knox boxes shall be installed on the latch side of the door(s).
3. A **KNOX ELEVATOR/LOBBY BOX SERIES #1403** is required in the lobby of each elevator bank at the lowest level of fire department access.
4. Additional Knox boxes may be required at other entry doors to the building when required by the Fire Code Official.
5. Each commercial tenant is required to provide and maintain the correct key(s) to their tenant space in the Knox box.
6. All Knox boxes are required to be installed no more than 5 feet 6 inches above finished grade, as approved.

KNOX BOX PLACEMENT FOR PEDESTRIAN GATES



1. Primary access points with a pedestrian gate require Fire Department access. A **KNOX BOX SERIES #3200** or **KNOX KEY SWITCH SERIES 3501** is required.

2. The final location and number of Knox boxes required will be determined by the Fire Code Official.





CHAPTER FIVE

Property Complex Address Directories

Contents:

- Address Directory Guidelines
- Entrance Islands into Residential Communities
- Apartment Monuments and Directories

Purpose:

A proper address directory placed at the entry of a complex aids all emergency responders attempting to find a location on a property with multiple buildings and/or suites (i.e., apartment complexes, hospital campuses).

ADDRESS DIRECTORY GUIDELINES

GENERAL

Approved graphic directories shall be provided at all driveway entrances for all multiple dwelling developments, mobile home parks, or when required by the Fire Marshal or Fire Code Official. Such directories shall be illuminated and conform to Pima County design standards and be approved by the Fire Marshal or Fire Code Official.

Prior to construction, plans shall be submitted to the Fire & Life Safety Division for review.

DIMENSIONS

The number of buildings in the complex shall determine the minimum dimensions of the directory:

1. Complexes of 12 or fewer buildings require 3x3 feet (9 square feet)
2. Complexes of 13 to 30 buildings require 4x4 feet (16 square feet)
3. Complexes of 31 or more buildings require 5x5 feet (25 square feet)

FRAMING

Framing materials shall not encroach upon the face of the directory by more than one and one half (1½) inches. Stanchions or supports shall not be included in the required size of the directory.

PROTECTION

The directory shall be protected against vandalism and disfigurement by a clear polycarbonate cover, with a minimum of one-eighth (⅛) inch thickness, sealed to protect from weather.

ILLUMINATION

Address directories shall be illuminated, either internally or externally, utilizing white light. The directory must be illuminated from dusk to dawn.

INSTALLATION REQUIREMENTS

Support posts or stanchions shall be set in concrete. Directories with dimensions of 3X3 feet (9 square feet) shall be 36 inches above grade. Directories with dimensions of 4X4 feet (16 square feet) and 5X5 feet (25 square feet) shall be 24 inches above grade.

PROHIBITION

Information such as advertising or additional artwork shall not be permitted on the directory.

DEPICTIONS

All depictions must be clear, easily understood and legible from a distance of eight (8) feet. The directory shall depict structures, building numbers, units, apartment space numbers, tennis courts, swimming pools, canals, waterfronts, driveways, streets, laundry rooms, fire hydrants, and other areas determined by the Fire Marshal. The depictions shall comply with the following:

1. Directories shall be provided at all driveway entrances for all multiple dwelling developments, mobile home parks, or when required by the Fire Marshal. Such directories shall be illuminated and shall conform to Pima County design standards and must be approved by the Fire Marshal.
2. The name and address of the complex is required but shall not exceed ten percent (10%) of the total size of the site directory.
3. Swimming pools, canals, and waterway areas shall be translucent blue or as approved.
4. Tennis courts shall be translucent green or as approved.
5. Fire hydrants shall be one-fourth (¼) inch diameter black circle filled with a translucent yellow center or as approved. The abbreviation “FH” must be affixed by the location of the fire hydrant on the directory.
6. The directory shall be properly oriented to the viewer with a red symbol, one (1) inch in diameter, with the words “You Are Here” affixed at the appropriate location on the directory.
7. There must be a north directional arrow affixed to the directory. This arrow must be a minimum of three (3) inches in size.
8. The colors used on the site directory may not be duplicated to represent more than one item.

SETBACKS

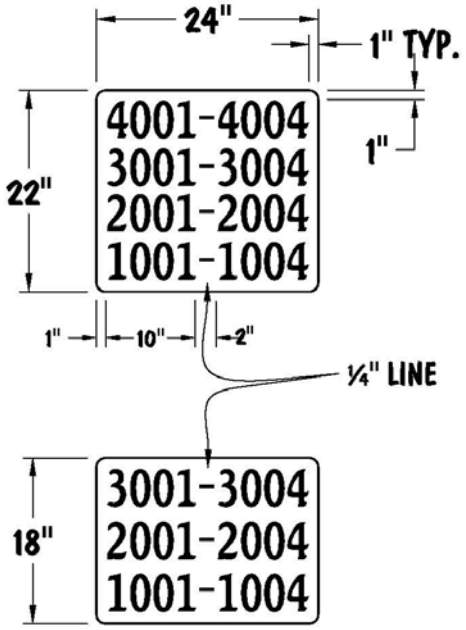
The directory shall be installed on the occupancy’s property and at a location approved by the Fire Marshal as follows:

1. The directory shall be set back from the street or curbing at least 25 feet to allow emergency vehicles to be clear of the public right-of-way;
2. Shall not exceed a distance of four (4) feet from the edge of the property driveway facing the direction of oncoming traffic;
3. Shall not conflict with traffic visibility zones as provided for by other ordinances;
4. Shall be immediately visible and free from obstructions including architectural design and landscaping.

CORRIDOR SPREAD PLATE SAMPLE DETAIL

Number Size (Four Digit Plate)
[Four Floors]

- 4” x 5/8” brush stroke
- 4 digit numbers – thousand series

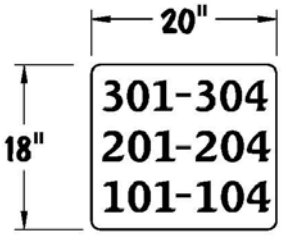


Number Size (Four Digit Plate)
[Three Floors]

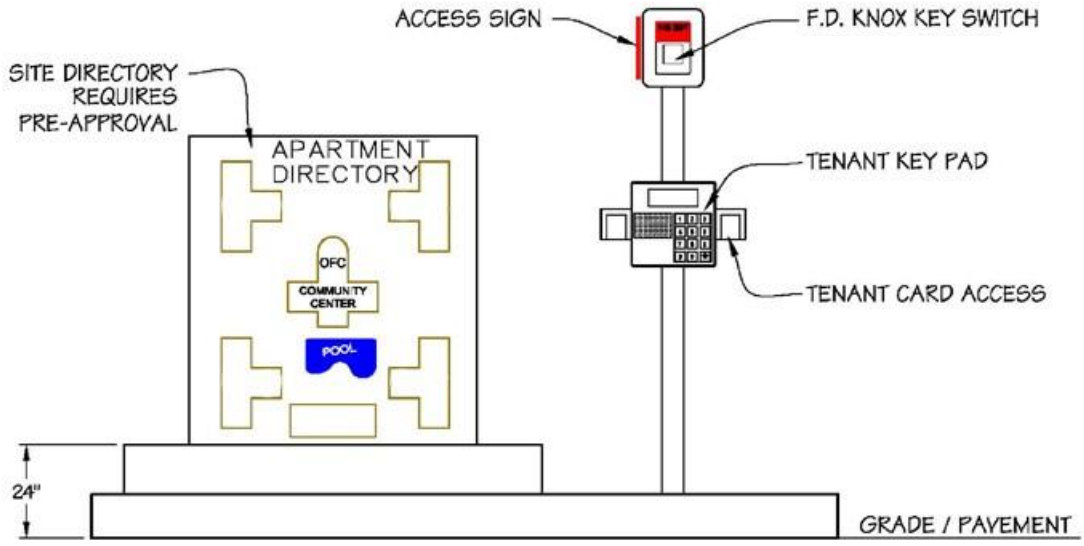
- 4” x 5/8” brush stroke
- 3 digit numbers – hundred series

Number Size (Three Digit Plate)
[Three Floors]

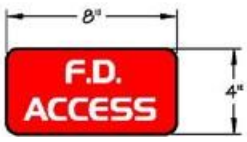
- 4” x 5/8” brush stroke
- 3 digit numbers – hundred series
- 101-199 number range



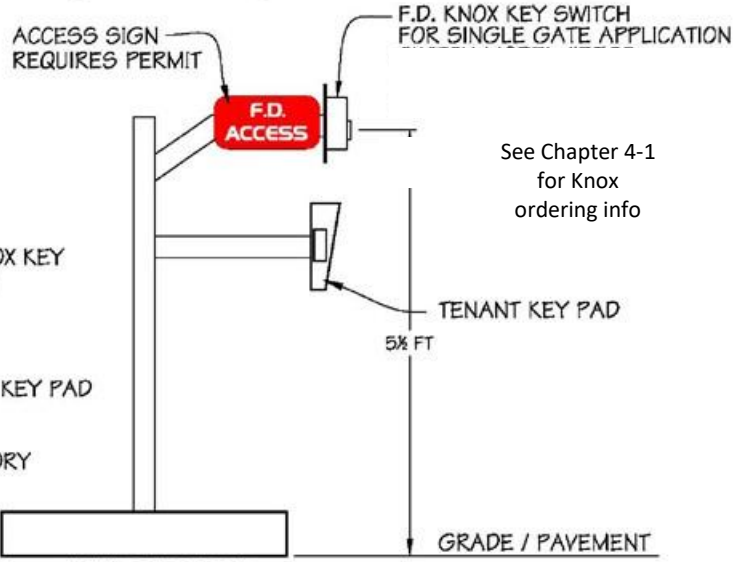
RESIDENTIAL COMMUNITY ENTRANCE ISLAND WITH AUTOMATIC GATES DETAIL



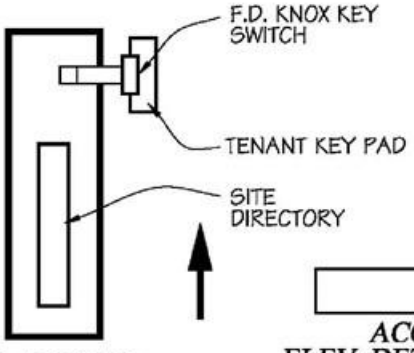
ENTRANCE ISLAND
ELEV. DETAIL (FRONT VIEW)



See Chapter 3-10 for sign detail



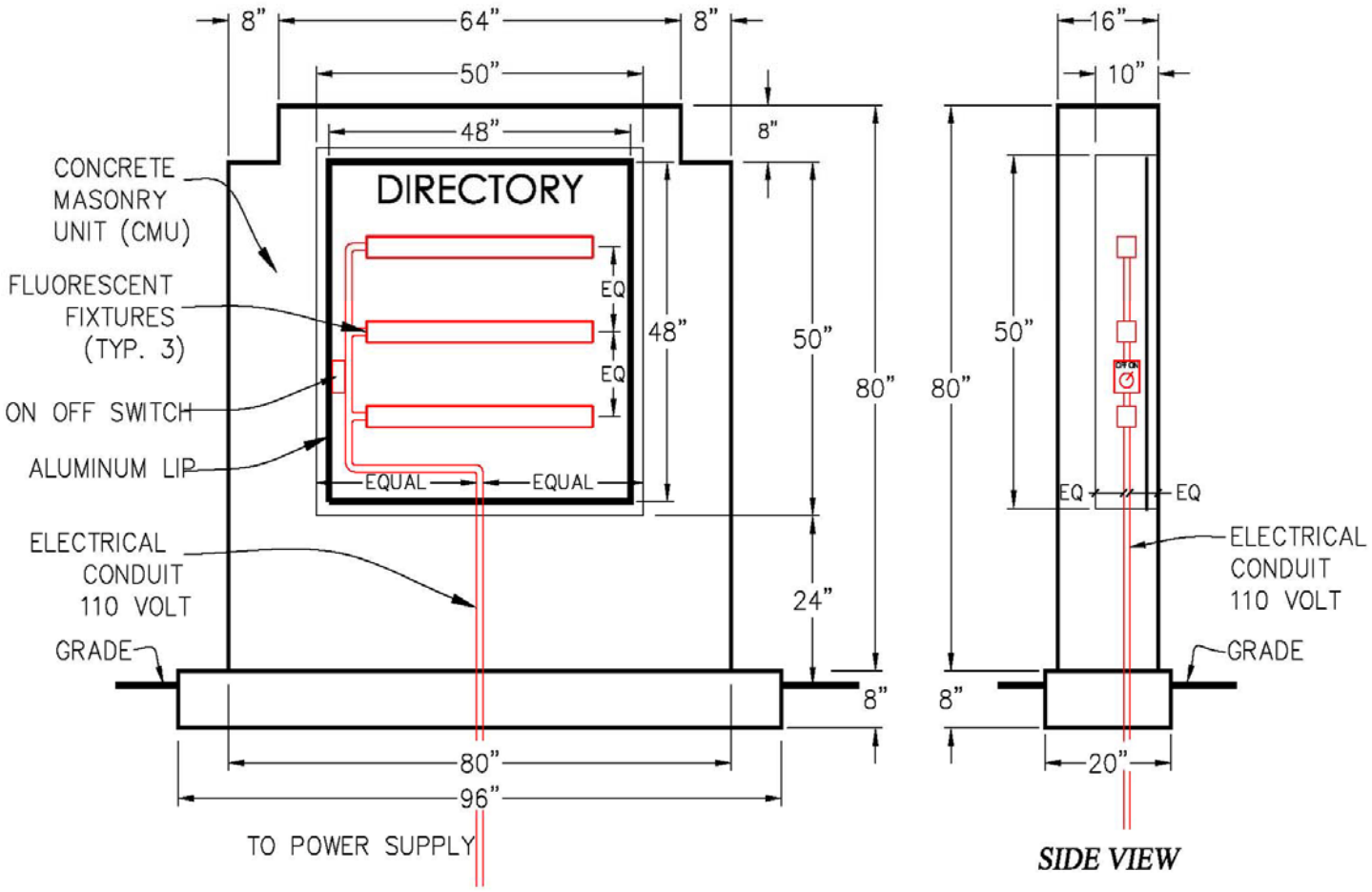
See Chapter 4-1 for Knox ordering info



PLAN VIEW

ACCESS PADS
ELEV. DETAIL (SIDE VIEW)

INTERNALLY ILLUMINATED SITE DIRECTORY DETAIL



ADDRESS DIRECTORY EXAMPLE



APARTMENT COMPLEX MONUMENT EXAMPLE



APARTMENT COMPLEX MONUMENT EXAMPLE



COMPLEX DIRECTORY EXAMPLE



CHAPTER SIX

Automatic Electric Gates

Contents:

- Contractor Requirements
- Installation and Electrical Requirements
- Preemption
- Knox Key Switch Placement and Installation
- Automatic Gate Signage
- Gate Maintenance

Purpose:

Emergency responders need dependable access through gates to deliver prompt service. Design of access needs to be uniform.

GATE CONTRACTOR REQUIREMENTS

LICENSE REQUIREMENTS

When installing, modifying or repairing a gate at any location that obstructs a fire apparatus access road, the gate contractor shall be licensed by the Arizona Registrar of Contractors. Accepted licenses are as follows:

1. To perform electrical work on gates: C-11 or CR-11
2. To install or modify gates: C-14, R-14 or CR-14



PLAN SUBMITTALS

A BUILDING DEPARTMENT PERMIT IS REQUIRED for electric gates. Obtain the permit at the appropriate Building Department: Pima County. Stamped, approved plans must be on site for all inspections.

Electrical inspections and approvals must be obtained prior to the final fire inspection.

SITE PLAN REQUIREMENTS

In addition to specific requirements detailed in this guide, site plans shall include the following information:

1. Name and address of the installing contractor.
2. Project location including address and suite numbers, if applicable
3. Orientation to streets, buildings and property lines
4. Graphic representation of the scale used on the drawing
5. Point of compass
6. Number of gates to be installed and their locations

VEHICLE ACCESS GATE REQUIREMENTS

1. Access gates shall be designed and installed such that they do not obstruct the egress or departure of emergency vehicles.
2. All clear openings as shown on plans shall be a minimum 20 feet clear width for BIDIRECTIONAL access roads and 14 feet clear width or larger for UNIDIRECTIONAL access roads.
3. Turning radius shall comply with AASHTO WB-40 turning radius requirements. When a 42-foot turning radius cannot be met, the fire code official may require additional clearance.
4. An approved **KNOX KEY SWITCH SERIES #3501** shall be used for 24-hour Fire Department access. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering details. The emergency key switch, when activated, shall bypass any occupant control and loop systems. When activated, the gate will remain in the open position until deactivated by the Fire Department. Only when deactivated will the gate resume normal operation.
5. The Knox key switch shall open both the entrance and exit gate(s) within 15 seconds when gate(s) are positioned in close proximity to each other. Gates shall remain in the open position until closed by operation of the electrical control device.
6. The Knox key switch shall be mounted between 5½ and 6 feet above grade (location shown on plan) on ENTRANCE side of gate. An additional key switch is required on the EXIT side of the gate when the gate does not automatically open on approach.
7. The Knox key switch shall be located within 12 inches of signage labeled “FD ACCESS”. See **Chapter 3-10: Fire Department Access Sign Detail** for sign specifications.
8. Preemption devices shall be installed on all automatic gates including single-family gated communities containing six or more homes and all multi-family gated communities, per Corona de Tucson Fire District installation requirements outlined in this chapter.
9. Gate operator(s) shall open at a rate of one foot per second. Parking barrier arms will open or clear in approximately two seconds.
10. Automatic gate operator(s) and/or parking barrier arm(s) shall be equipped with battery backup on ENTRANCE and EXIT gates or be connected to an emergency generator.

11. Residential/multifamily gates will open on battery backup during loss of power and remain open until the power is restored (fail safe).

12. Gates on commercial/industrial properties remain closed until the emergency gate switch is activated, then open on battery backup (fail secure).

13. Electric gate operators shall be listed in accordance with UL325 (Standard for Door, Drapery, Gate, Louver and Window Operators and Systems). Gates intended for automatic operation shall be designed, constructed and installed to comply with requirements of ASTM F 2200 (Standard Specifications for Automatic Vehicular Gate Construction).

ELECTRIC GATE ACCESS SYSTEM

APPROVED STROBE SWITCHES

STROBESWITCH is a compact low-cost detector, which recognizes a coded strobe light signal from special emitters mounted on fire vehicles and ambulances. The system provides an output activation of the emergency access switch. In the Corona de Tucson Fire District approved configuration, two detectors are used – one to sense entering emergency vehicles and another to facilitate quick exit. Both detectors are mounted on a rugged weatherproof power module that contains all additional processing circuitry. The assembly provides a dry relay closure signal to the gate operator and requires only 24 VAC input power to operate. Exit gates are permitted to open with an approved approach sensor or weight sensor in lieu of preemption devices installed on the egress side.

HOW IT WORKS

The emergency vehicle uses a special strobe light to transmit a continuously flashing optical signal. The **TOMAR Model 2795-2 STROBESWITCH** (or equivalent) receives this signal, and if the signal format is correct, activates a relay. The relay contacts may be used to control security gates, Fire Department garage doors, and other devices. Signaling is optical by line-of-sight, and the 2795-2 can operate indoors or outdoors, in bright sunlight, or in any weather. The unit is not susceptible to radio frequency interference, and uses digital frequency discrimination to reject unwanted signals, such as flashlights, emergency vehicle lighting systems, flashing signs, etc.

HOW TO OBTAIN

Conduct an internet search for Gates and Operating Devices. Any authorized gate company licensed by the Arizona Registrar of Contractors with a C-14, R-14 or CR-14 license may perform the work.



APPROVED ACCESS REQUIREMENTS FOR PREEMPTION DEVICES

All electric gates shall be equipped with (or have installed) approved preemptive control opening equipment and a Knox key switch compatible with the Fire District's existing system.

MINIMUM STANDARD FOR INSTALLATION

- Each gate shall have two approved individual Tomar detectors or an approved Tomar Dual Strobeswitch, model 2795-2 (or equivalent). Exit gates are permitted to open with an approved approach sensor or weight sensor in lieu of preemption devices installed on the egress side.
- Individual detectors shall be mounted together with the power module in a dual detector mounting box, or with an approved Tomar Dual Strobe switch, model 2795-2 or equivalent.
- Detectors shall be mounted 8 to 10 feet above grade.
- Detectors shall be located a minimum of 18 inches behind the access gate on the property side when mounted on a dedicated post.
- When used for mounting, metal posts shall be cemented a minimum of 18 inches below grade.
- Detectors shall point toward the path of the emergency vehicle travel.
- Detectors' sight paths shall be free of visual obstructions such as signs, covered parking canopies, and vegetation.
- Detectors shall activate at a minimum of 150 feet from gate.
- An approved **KNOX KEY SWITCH SERIES #3501** shall be provided as a manual backup. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.
- The entrance Knox switch shall be located above the keypad, where applicable. When mounted on the detector post, the Knox switch shall be mounted at 5½ feet to 6 feet above grade.

ITEMS TO BE COORDINATED WITH GATE COMPANY

1. A dedicated 15-AMP circuit breaker must be provided for each gate motor. (It is recommended to use a 20-AMP circuit breaker.)
2. 110-volt power must be provided to gate motors.
    a. Exception: Gate operators that run on low voltage or solar power.
3. A minimum ½ inch conduit shall be provided for:
    a. Service meter (electrical panel to master operator)
    b. Master operator to the slave operator, if applicable
    c. Closest operator to the preemption detectors
    d. Closest operator to Site Directory
    e. Telephone line, if applicable
    f. (¾ inch or larger conduit is recommended for best results)
4. It is recommended that two conduits be run to each device. Running low voltage and 110-volt wiring in the same conduit (even with properly rated wire) can cause cross talk, static and/or malfunctions and is not in compliance with the National Electrical Code.
5. Bury conduit a minimum of 24 inches under driveways and 18 inches in landscaped areas.
6. Landscaping shall not obstruct the sight path of preemption detectors.

Remember that these strict guidelines have been developed to protect the public (your customer) from unreliable installations, and above all, emergency response delays.

ELECTRICAL REQUIREMENTS FOR NEW GATED COMMUNITIES

1. The Electrical Site Plan must show:

   a. An individual branch circuit of a minimum 15-ampere and raceway of a minimum ½ inch serving each automatic gate. **(20 ampere and ¾ inches or larger raceway/conduit is recommended.)**

   b. The service equipment location and/or panel board location.

   c. The panel board schedule and new and/or revised load calculations.

   d. The location of the automatic gate operator(s), control equipment and actuation devices.

2. A **separate electrical permit** shall be obtained for each automatic gate through the Pima County unless the vehicle gate(s) are shown on the scope of work for another permit. **If the gates are included in another permit, make sure the gates are scheduled for a final electrical inspection before that permit is closed out.**

3. Have conduit depth inspected for the gate operators, preemption detectors, resident keypad and Knox Key Switches prior to scheduling a final fire inspection.

4. Have **final** electrical inspection for gates. A passed final inspection must be obtained **before** the gate company can call for a Fire District inspection.

5. Items that will be inspected for electrical final:

   a. Electrical Underground for Gate

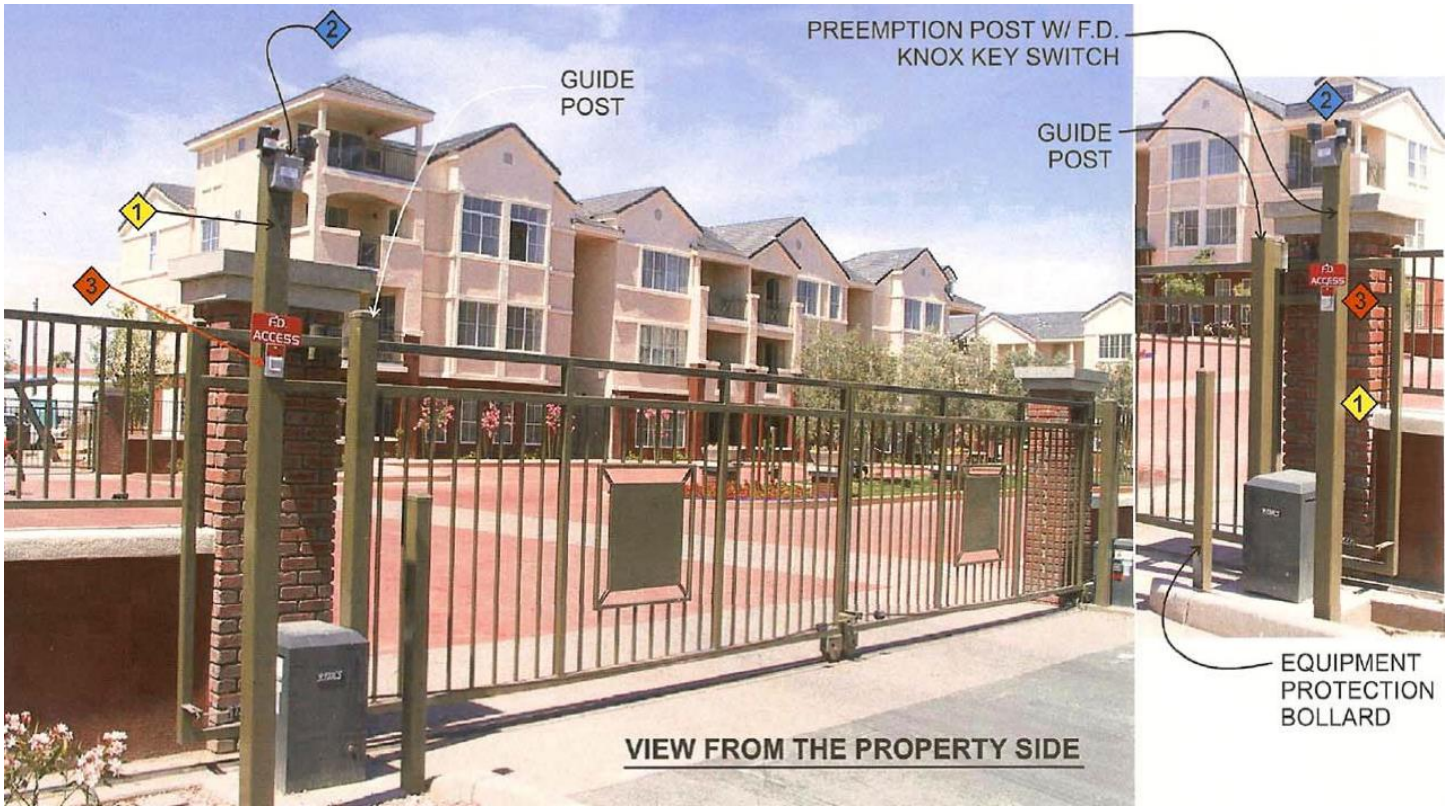
   b. Final Electrical Inspection for Gate

   c. Proper Grounding

   d. 110-volt connections

   e. Disconnect provided within site (NEC 2011, Article 430)

MULTI-FAMILY RESIDENCE
PREEMPTED AUTOMATIC GATE DETAIL

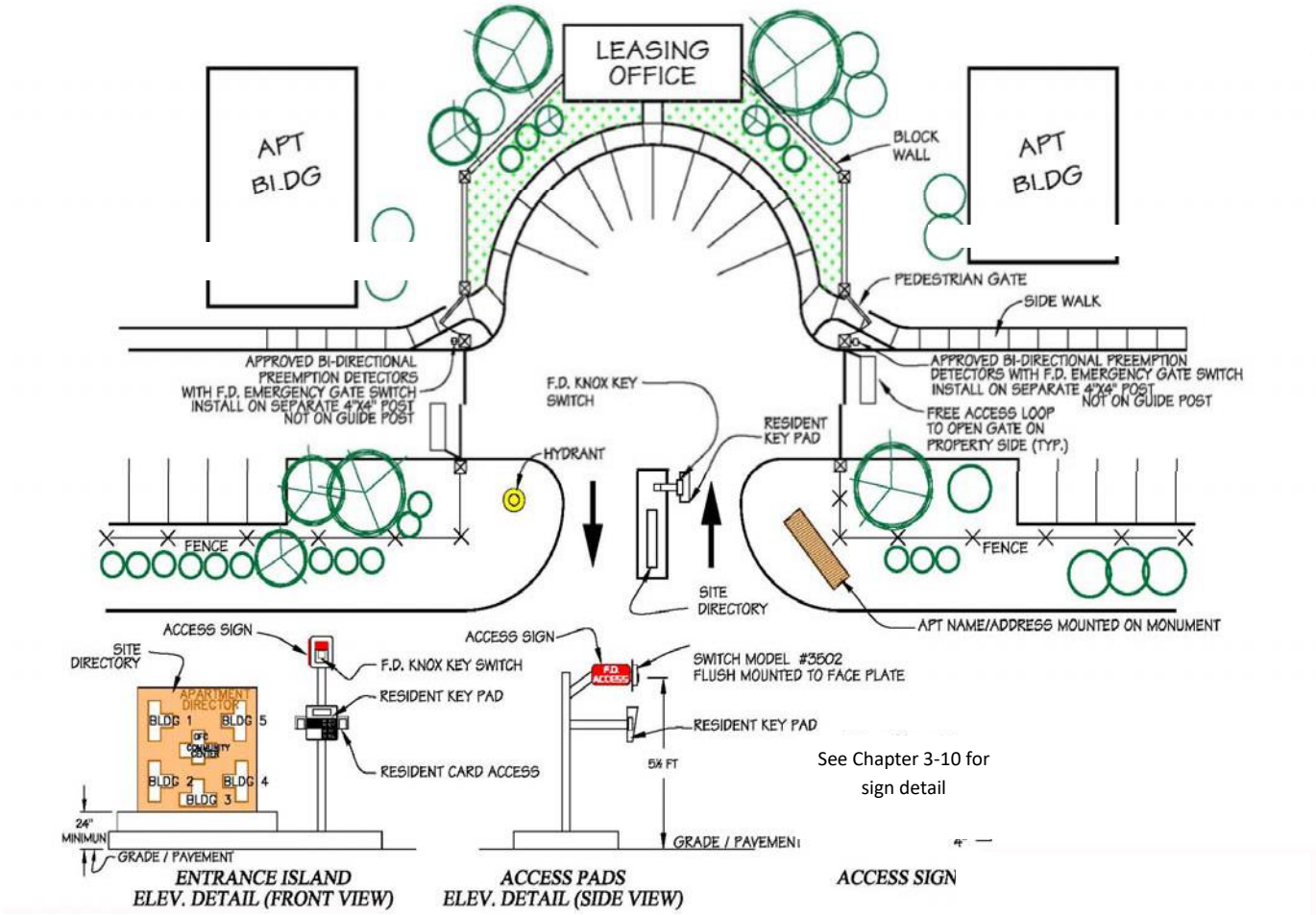


1. Detectors mounted on 4x4 inch post 8 feet to 10 feet above finished final grade.

2. Fire Department approved Tomar Dual Strobe Switch detector model #2795-2 or equivalent.

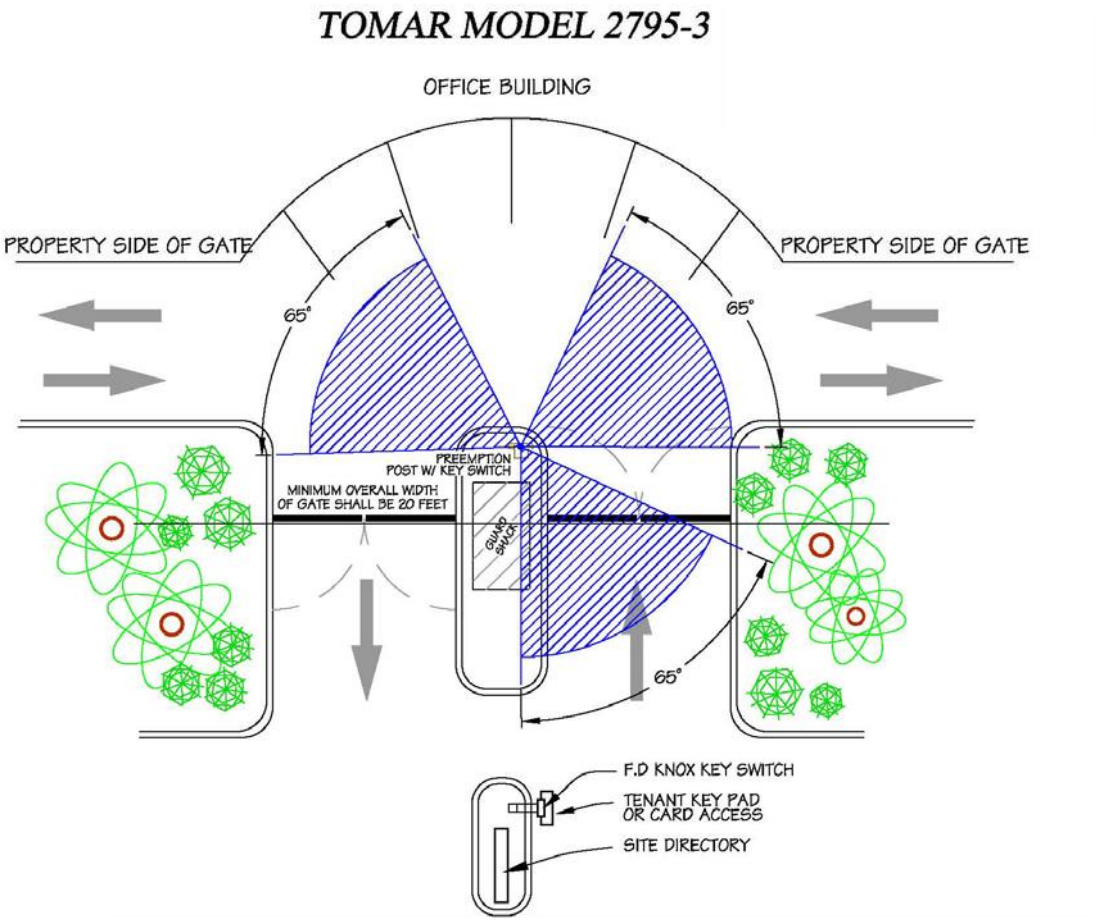
3. Fire Department approved **KNOX KEY SWITCH #3501** series with FD Access sign. See **Chapter 3-10: Fire Department Access Sign Detail** for sign specifications and see **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.

TYPICAL ENTRANCE TO MULTIPLE RESIDENTIAL COMMUNITIES WITH AUTOMATIC GATES



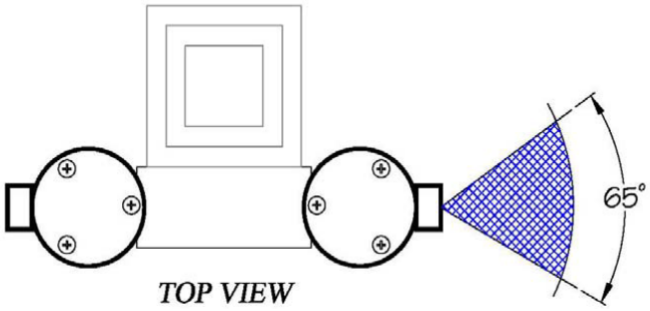
See Chapter 3-10 for sign detail

AUTOMATIC GATE ENTRANCE WITH 3-STROBE DETECTORS DETAIL

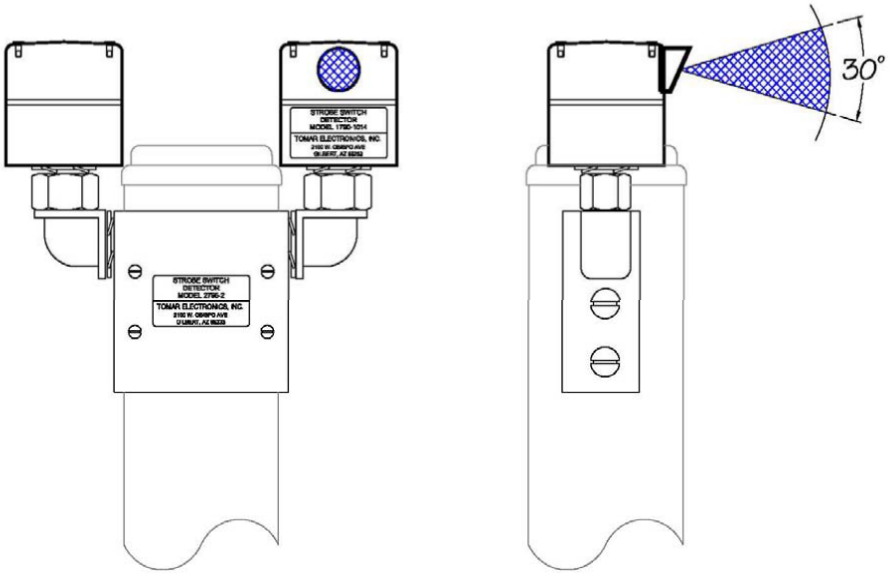


1. Detectors shall be mounted 8 to 10 feet from grade. Mirrors shall not substitute the requirements of multiple detectors per gate.
2. Detectors shall point toward the path of the emergency vehicles. Detectors must activate at a minimum of 150 feet from gate.
3. The power module shall be mounted in an electrical junction box.
4. An approved **KNOX KEY SWITCH SERIES #3501** shall be installed on the entrance side of access gate. Entrance switch shall be located above the key pad, if applicable, at 5½ feet to 6 feet from grade. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.

TOMAR PREEMPTION DETECTOR MODEL 1790-1014 (or equivalent)



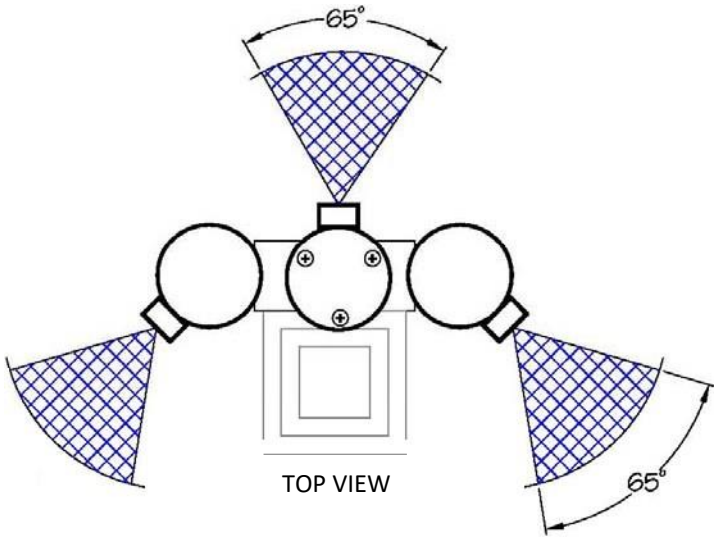
TOP VIEW



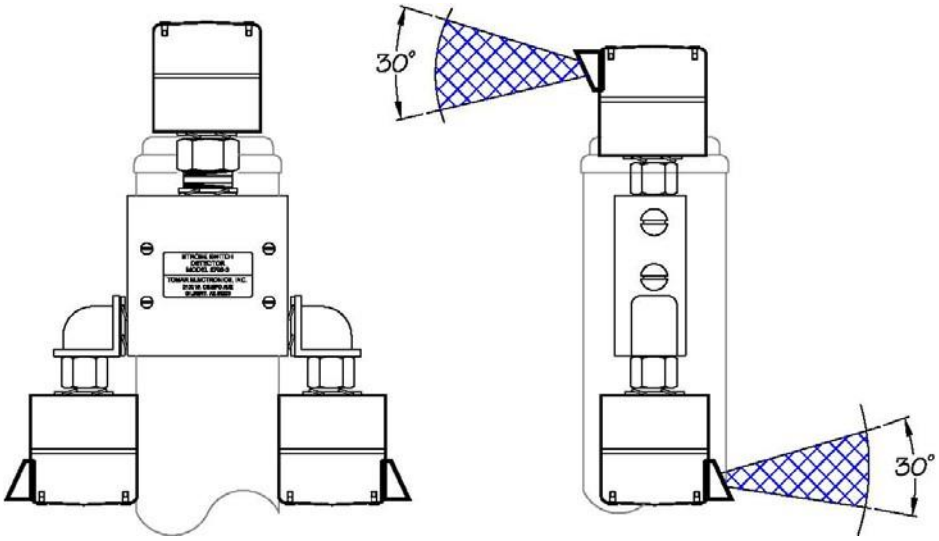
FRONT VIEW

SIDE VIEW

TOMAR PREEMPTION DETECTOR MODEL 2795-3 (or equivalent)



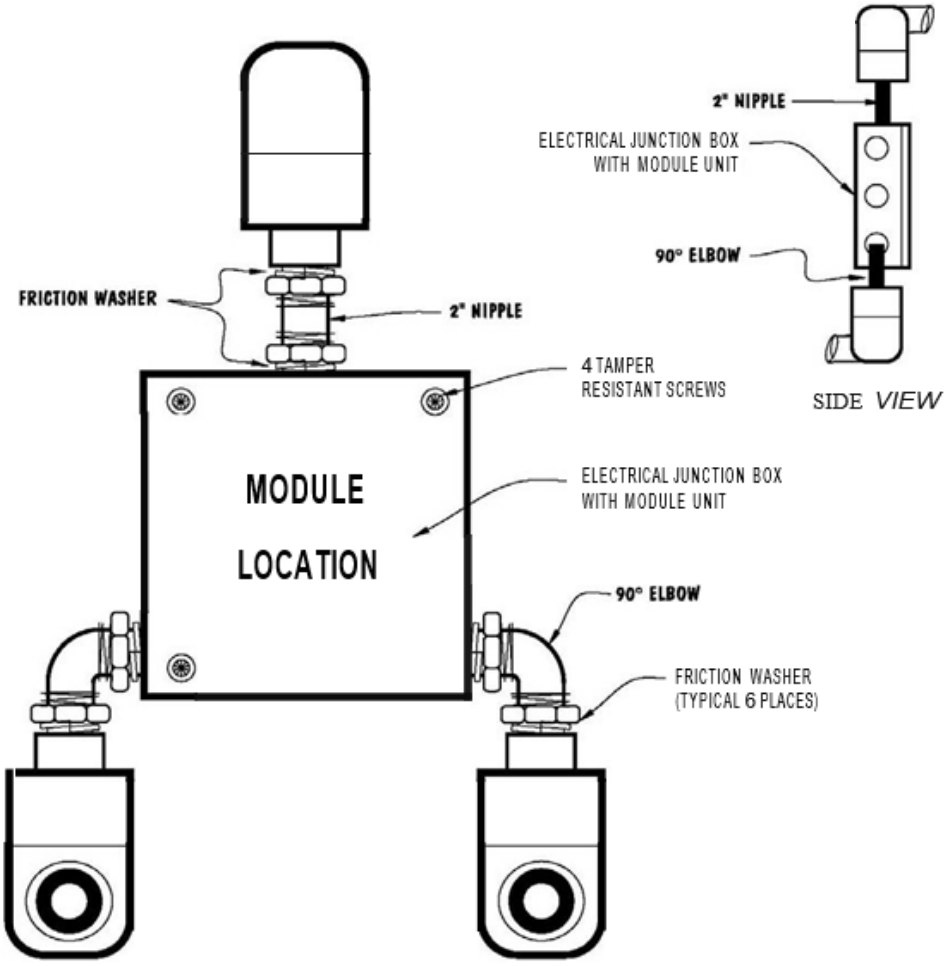
TOP VIEW



FRONT VIEW SIDE VIEW

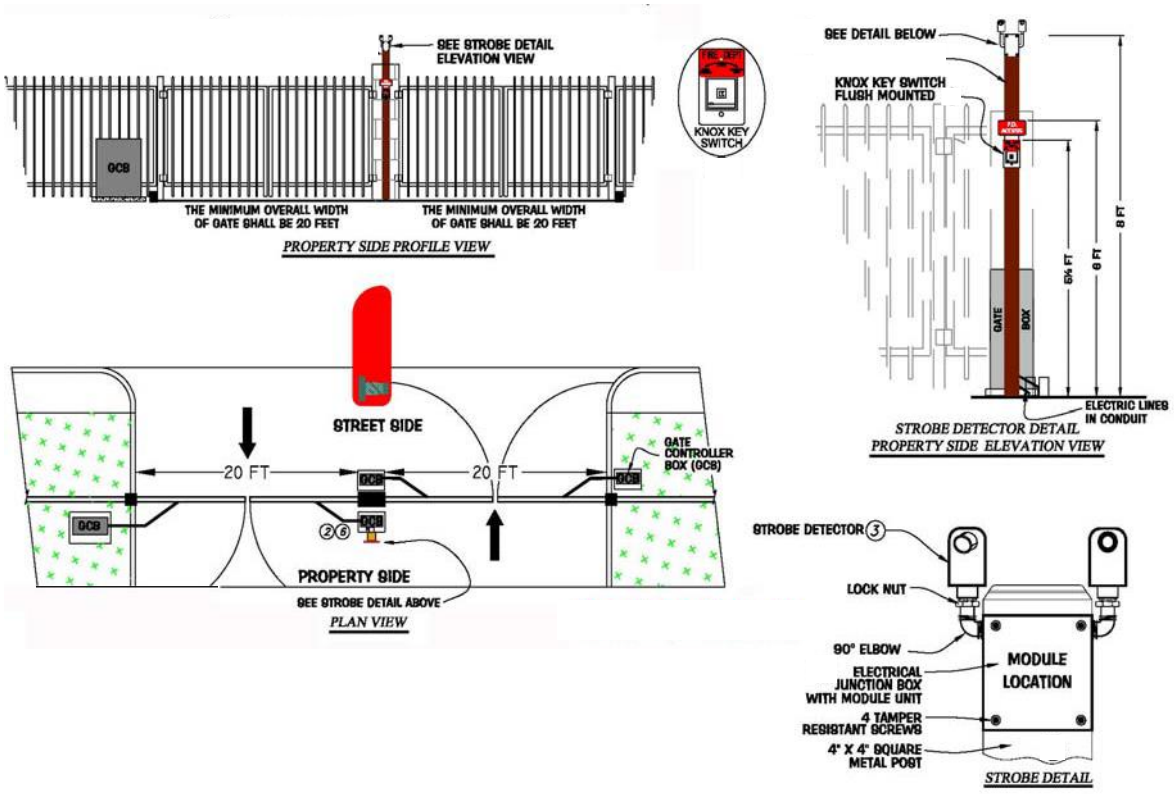
1. Three heads are required with 90 degree turning layouts.

AUTOMATIC GATE STROBE DETAIL



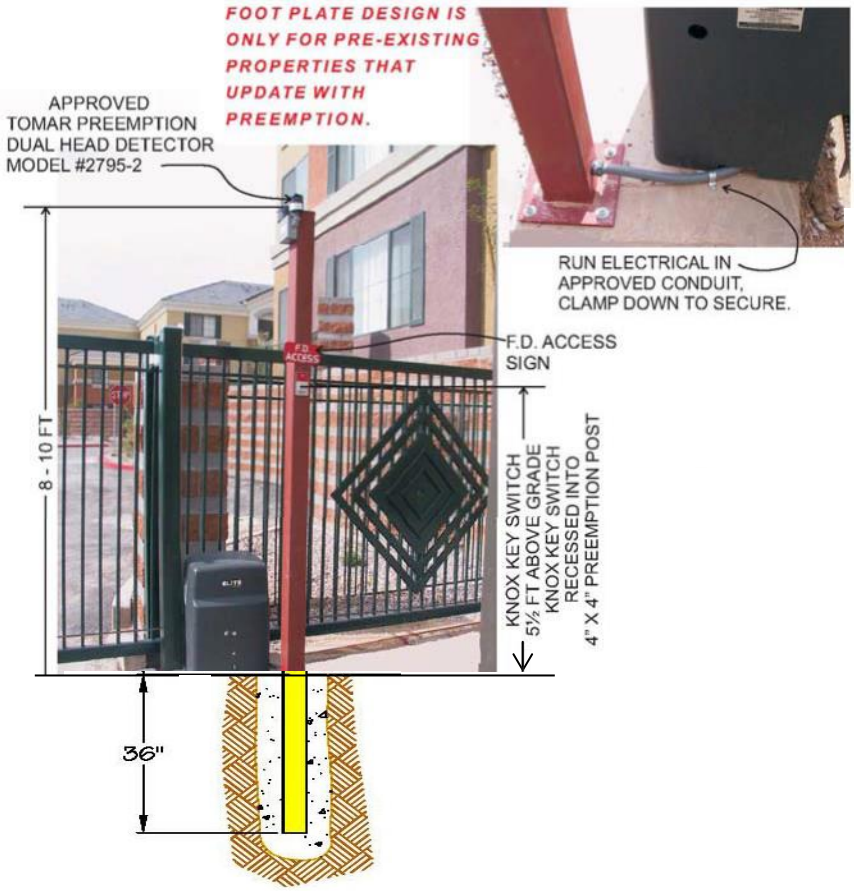
1. Three heads are required with 90 degree turning layouts.

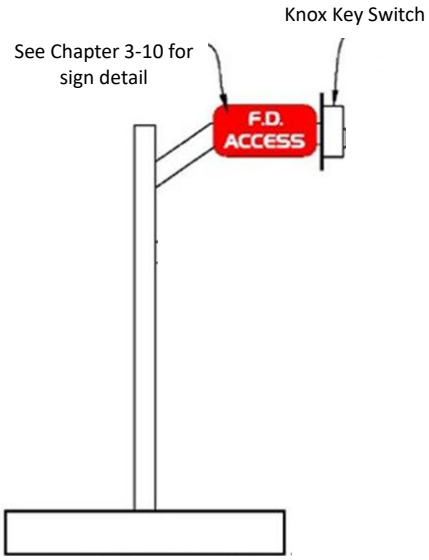
APPROVED AUTOMATIC FIRE DEPARTMENT ACCESS GATE PREEMPTION DETECTORS WITH KNOX KEY SWITCHES DETAIL



1. Each automatic gate shall have two detectors or an approved Tomar Dual Strobeswitch, model 2795-2 or equivalent. Exit gates are permitted to open with an approved approach sensor or weight sensor in lieu of preemption devices installed on the egress side.
2. Detectors shall be mounted 8 to 10 feet from grade. Mirrors shall not substitute the requirements of two detectors per gate.
3. Detectors shall point toward the path of emergency vehicles.
4. Detectors must activate at a minimum of 150 feet from gate.
5. The power module shall be mounted in an electrical junction box.
6. An approved emergency **KNOX KEY SWITCH SERIES #3501** shall be installed on the entrance access gate. Switch shall be located 5½ feet to 6 feet above grade. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.

SPECIAL APPLICATION FOR RETROFITTING WITH PREEMPTION DETAIL





ELEVATION DETAIL

1 Each automatic gate shall have two detectors or an approved Tomar Dual Strobeswitch, model 2795-2 or equivalent. Exit gates are permitted to open with an approved approach sensor or weight sensor in lieu of preemption devices installed on the egress side.

2 Detectors shall be mounted eight (8) to ten (10) feet from grade.

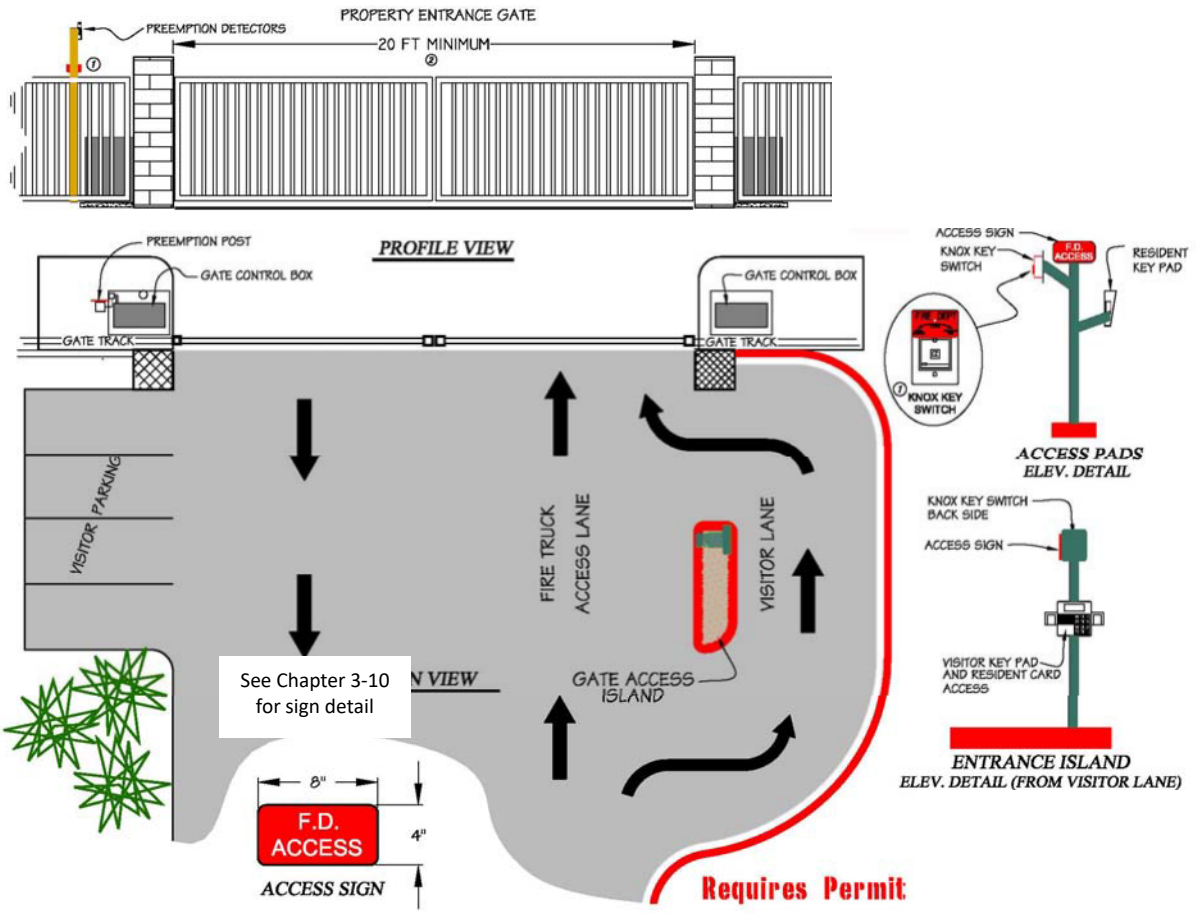
3 Detectors shall point toward the path of the emergency vehicles.

4 Detectors must activate within 150 feet from gate.

5 The power module shall be mounted in an electrical junction box.

6 An approved **KNOX KEY SWITCH SERIES #3501** shall be installed on the entrance access gate. Entrance switch shall be located above the key pad, if applicable, at 5 ½ feet to 6 feet from grade. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.

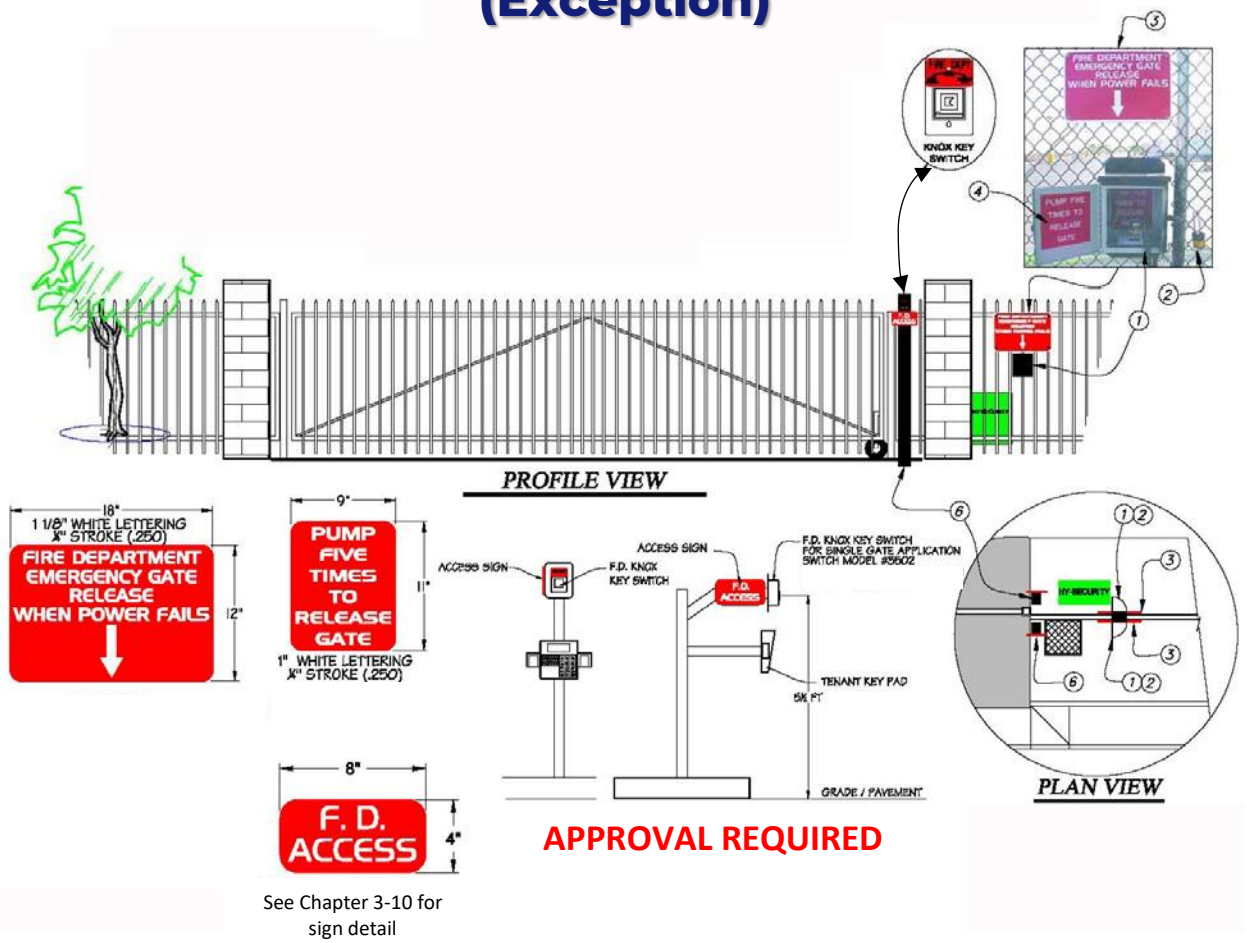
COMPLEX EXAMPLE



1. Provide an approved **KNOX KEY SWITCH SERIES #3501** on guest key pad pedestal at the entrance and Knox key switch on preemption post on property side both installed 5 ½ feet to 6 feet above finished final grade. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.

2. The minimum overall width of the gate opening shall be 20 feet for bidirectional access roads and 14 feet for unidirectional access roads. Notice: larger openings are preferred, if possible.

AUTOMATIC GATE WITHOUT BATTERY BACK-UP (Exception)

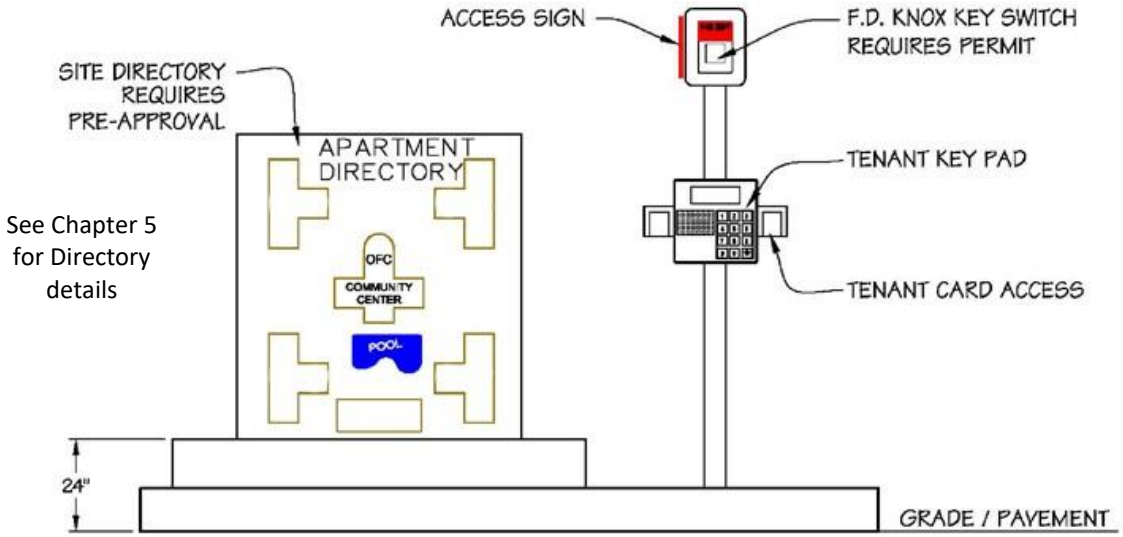


APPROVAL REQUIRED

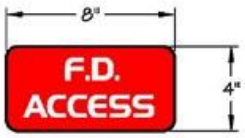
See Chapter 3-10 for sign detail

1. Gate release pump to be accessible from both sides of gate, three feet from gate.
2. Lock cabinet doors with an approved **KNOX PADLOCK SERIES #3781 0r #3782**, one for each door. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.
3. Locate emergency gate release sign above pump box, on both sides of gate.
4. Locate pump sign on inside of pump box doors.
5. For residential properties – an approved **KNOX KEY SWITCH SERIES #3501** shall be located on a pedestal above tenant key pad. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information.
6. The minimum overall width of the gate opening shall be 20 feet for bidirectional access roads and 14 feet for unidirectional access roads. **Notice:** larger openings are preferred, if possible.

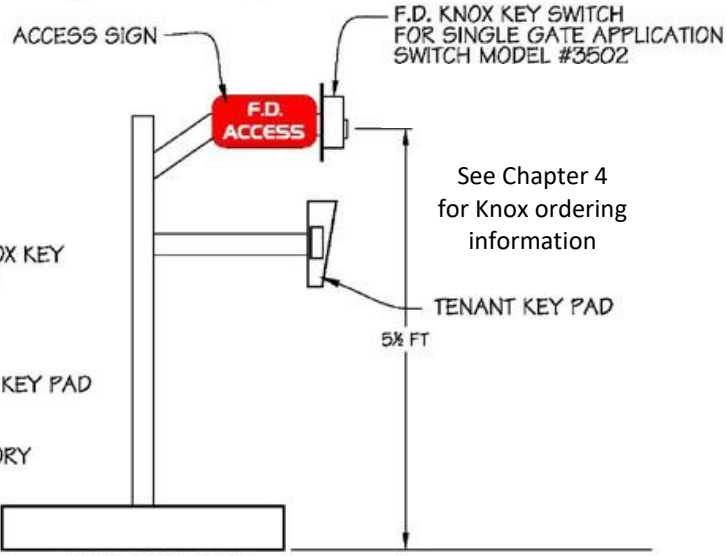
RESIDENTIAL COMMUNITY ENTRANCE ISLANDWITH AUTOMATIC GATES DETAIL

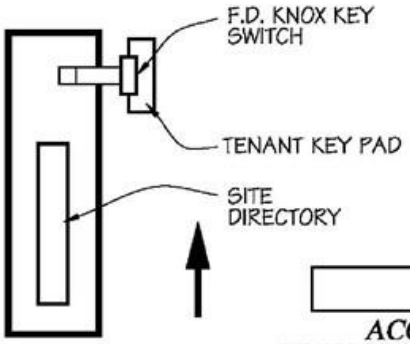


ENTRANCE ISLAND
ELEV. DETAIL (FRONT VIEW)



See Chapter 3-10
for sign detail





PLAN VIEW

ACCESS PADS
ELEV. DETAIL (SIDE VIEW)

PREEMPTION DUAL STROBE SWITCH DETECTOR PLACEMENT



GATE MAINTENANCE

All fire apparatus access gates shall be maintained operable at all times. Controlled access gates that are inoperable or impede the entrance of fire apparatus or emergency vehicles shall be secured in the open position until repaired or removed at the owner's expense.

UNPERMITTED GATE INSTALLATIONS

Controlled access gates crossing fire apparatus access roads that have been installed without permits shall be addressed as following:

1. Secure the gate(s) in the open position until permits have been obtained and all final inspections have been performed and approved OR
2. Remove the gate(s) at the owner's or installing contractor's expense.

CHAPTER SEVEN

Manual Vehicle & Pedestrian Gates

Contents:

- Contractor Requirements
- Installation Requirements for Manual Gates
- Knox Dual Padlock Locking System
- Manual Gate Signage
- Pedestrian Gates

Purpose:

Emergency responders need uniform and dependable access through gates to deliver prompt service to the community.

GATE CONTRACTOR REQUIREMENTS

LICENSE REQUIREMENTS

When installing, modifying or repairing a gate at any location that obstructs a fire apparatus access road, the gate contractor shall be licensed by the Arizona Registrar of Contractors. Accepted licenses are C-14, R-14 or CR-14

SITE PLAN REQUIREMENTS

In addition to specific requirements detailed in this guide, site plans shall include the following information:

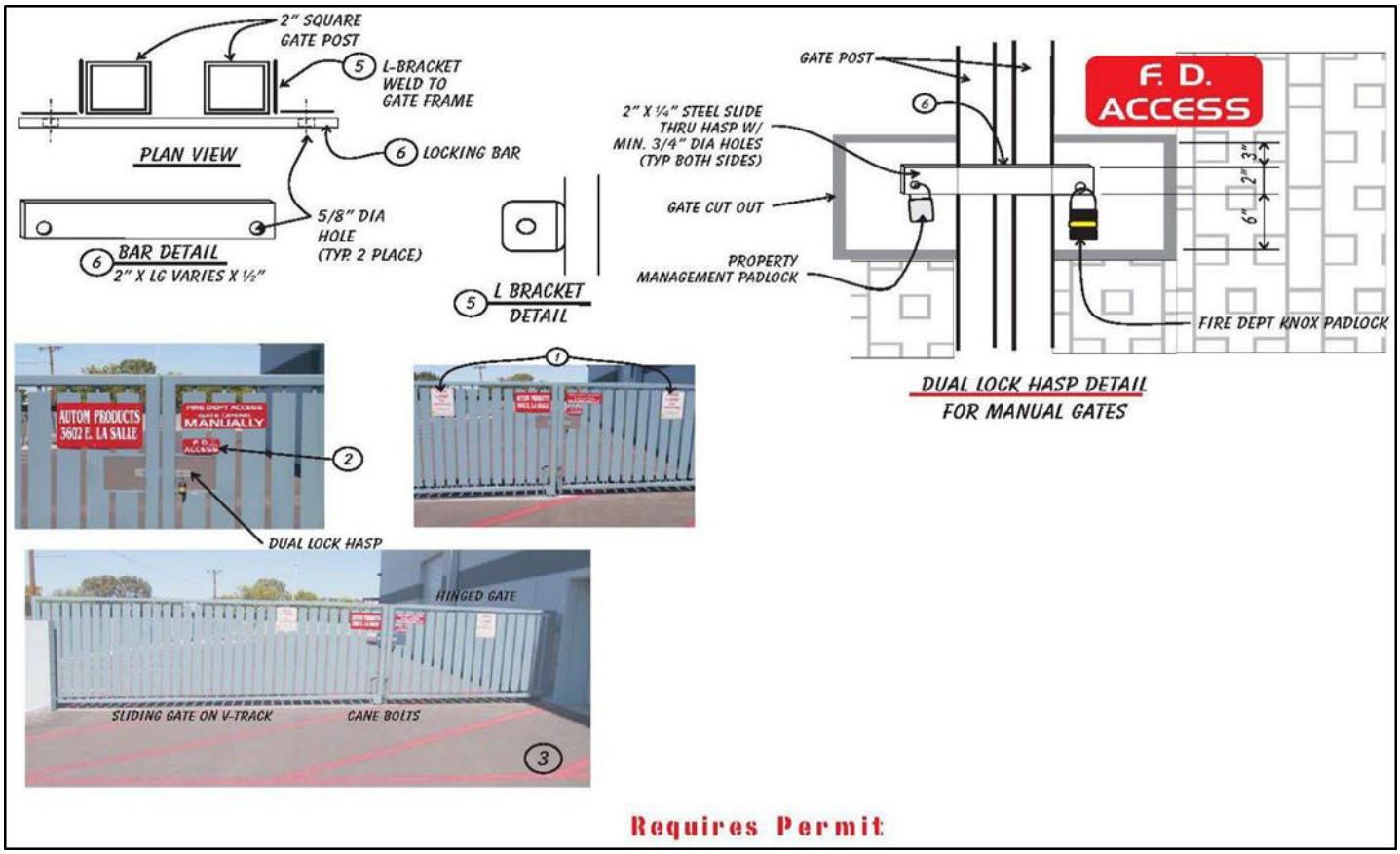
- Name and address of the installing contractor.
- Project location including address and suite numbers, if applicable
- Orientation to streets, buildings and property lines
- Graphic representation of the scale used on the drawing
- Point of compass
- Number of gates to be installed and their locations

INSTALLATION REQUIREMENTS FOR MANUAL GATES

1. All clear openings as shown on plans shall be a minimum 20 feet clear width for BIDIRECTIONAL access roads and 14 feet clear width or larger for UNIDIRECTIONAL access roads. If gating an existing drive, the current width of drive must remain as the original approved clear access width.
2. Turning radius shall comply with AASHTO WB-40 turning radius requirements. When a 45-foot turning radius cannot be met, the fire code official may require additional clearance.
3. All manual controlled gates that cross fire apparatus access roads or other roads to areas where immediate access is necessary for life saving or firefighting purposes (as determined by the Fire Code Official) shall use an approved dual padlock locking bar and an approved **KNOX PADLOCK SERIES #3781 0r 3782**. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox ordering information. See specific manual gate type included in Chapter 7 for dual padlock locking bar detail.
4. Fire Department approved “No Parking” signs shall be bolted back to back on each side of the gate(s). A total of 4 signs are required per gate. See specific manual gate type included in Chapter 7 for sign placement detail. See **Chapter 2: Fire Lanes and FD Access for fire lane sign specifications.**
5. When required by the Fire Code Official, a sign that identifies the location of the property’s primary entrance shall be bolted on the street side of the gate(s). See **Chapter 7-6: Property Identification Access Sign Sample Detail for sign detail.**

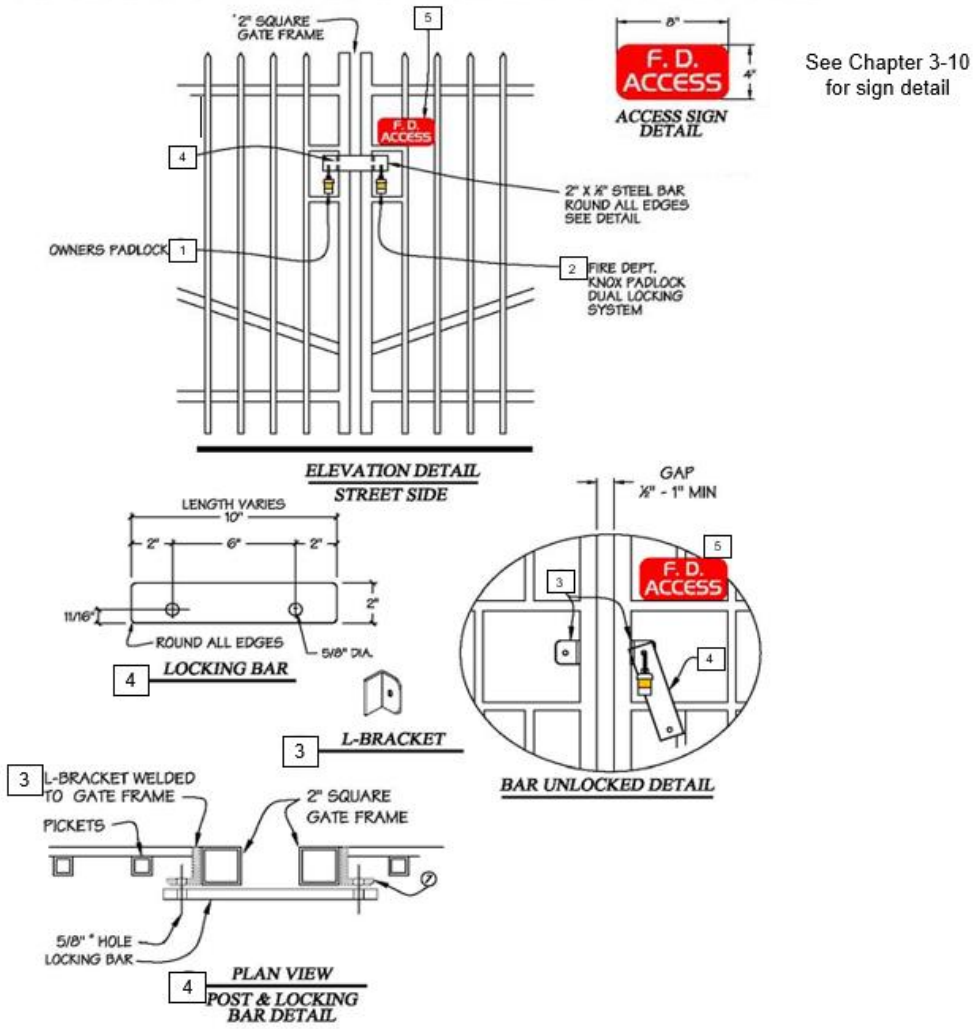


MANUAL ROLLING GATE DETAIL



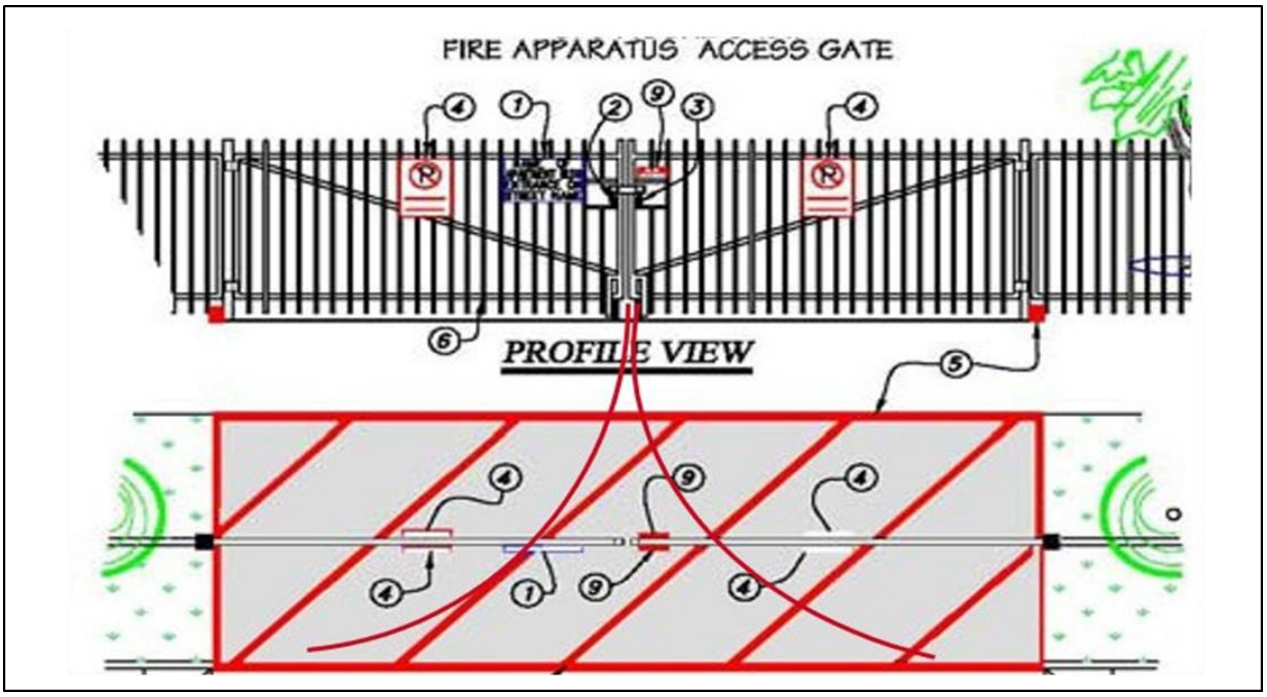
1. Approved fire lane signs with reflective background, placed back-to-back and fastened on all 4 corners. See **Chapter 2: Fire Lanes and FD Access for sign specifications.**
2. Approved Fire Department Access sign w/ reflective background placed back-to-back. See **Chapter 3-10: Fire Department Access Sign Detail for sign specifications.**
3. When required by the Fire Code Official, pavement striping shall be painted Safety Red with six (6) inch wide hash striping approximately 4 to 6 feet apart.
4. The minimum overall width of the gate opening shall be 20 feet for a single gate and 14 feet for unidirectional travel.
5. Weld modified L-bracket to gate frame.
6. Locking bar length is determined by the frame width and gap width between the two gates. Remove all sharp edges/round all corners. Drill a minimum ¾" diameter hole. Hole diameter is determined by the padlock size.
7. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox key switch and Knox padlock information and ordering.

SWING GATE WITH KNOX PADLOCK DETAIL



1. Property owner / management padlock.
2. An approved **KNOX PADLOCK SERIES #3781 or 3782** series shall be accessible from both sides of the gate (entrance & exit). See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox padlock information and ordering.
3. Weld Modifier L-bracket to gate frame. Round all edges & round all corners.
4. Locking bar length is determined by the frame width and the gap width between the two gates. Remove all sharp edges.
5. Approved Fire Department access sign with red reflective background placed back-to-back. See **Chapter 3- 10: Fire Department Access Sign Detail for sign specifications**.

ROLLING GATE WITH KNOX PADLOCK DETAIL



1. When required by the Fire Code Official, provide an approved sign, with reflective background, to identify the name of the complex or property and the location of the access entrance. See **Chapter 7-6: Property Identification Access Sign Sample Detail for sign specifications**. Sign requires pre-approval by the Fire Code Official.
2. Property owner / management padlock.
3. An approved **KNOX PADLOCK SERIES #3781 or 3782** shall be accessible from both sides of the gate (entrance & exit). See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox padlock information and ordering.
4. Approved Fire Lane signs with reflective background, placed back to back, and fastened on all four corners. See **Chapter 2: Fire Lanes and FD Access for sign specifications**.
5. When required by the Fire Code Official, six (6) inch parking lot striping shall be placed at the locations shown, on concrete curbs, and applied to asphalt.
6. The minimum overall width of the gate opening shall be 20 feet.
7. Weld Modifier L-bracket to gate frame. Round all edges & round all corners.
8. Locking bar length is determined by the frame width and the gap width between the two gates. Remove all sharp edges.
9. Approved Fire Department access sign with red reflective background placed back-to-back. See **Chapter 3- 10: Fire Department Access Sign Detail for sign specifications**.

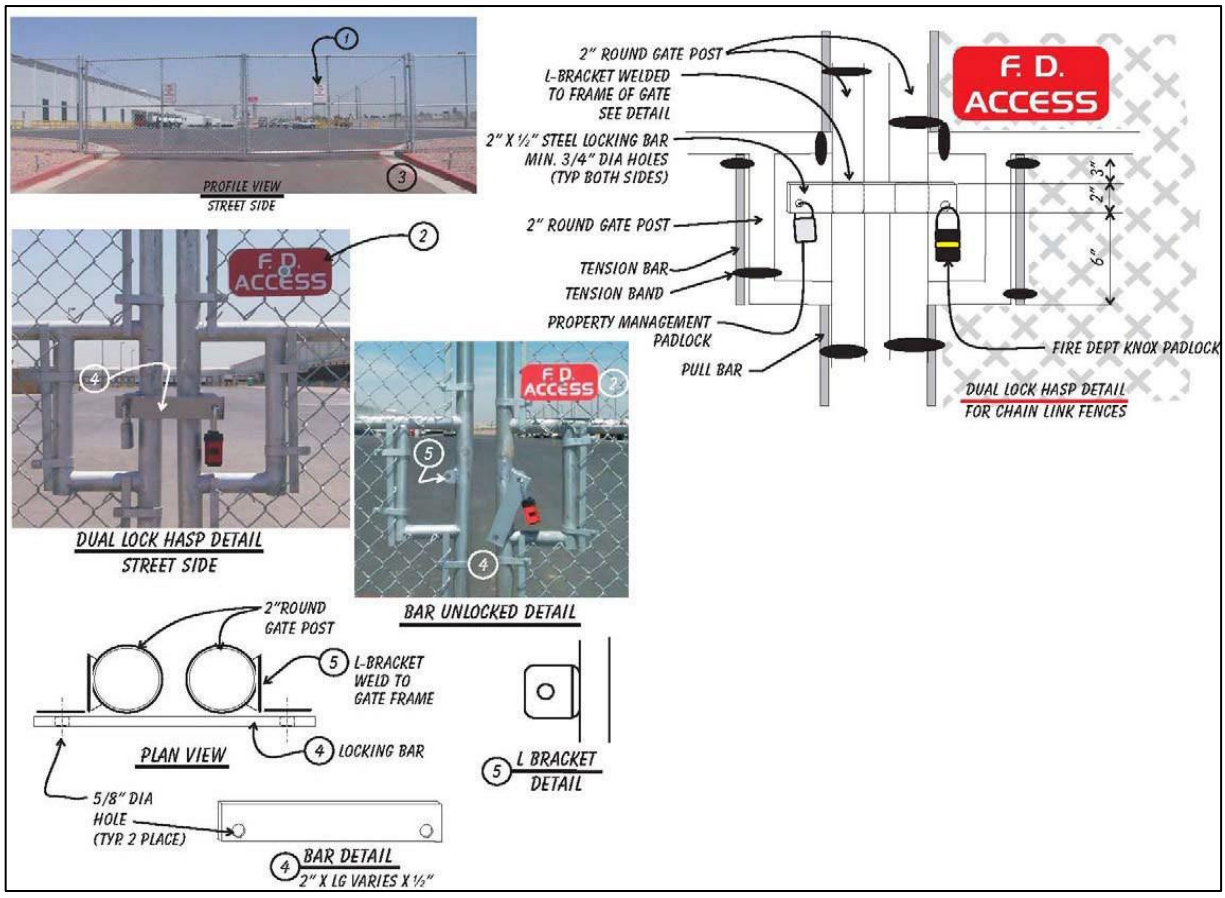
PROPERTY IDENTIFICATION ACCESS SIGN

SAMPLE DETAIL



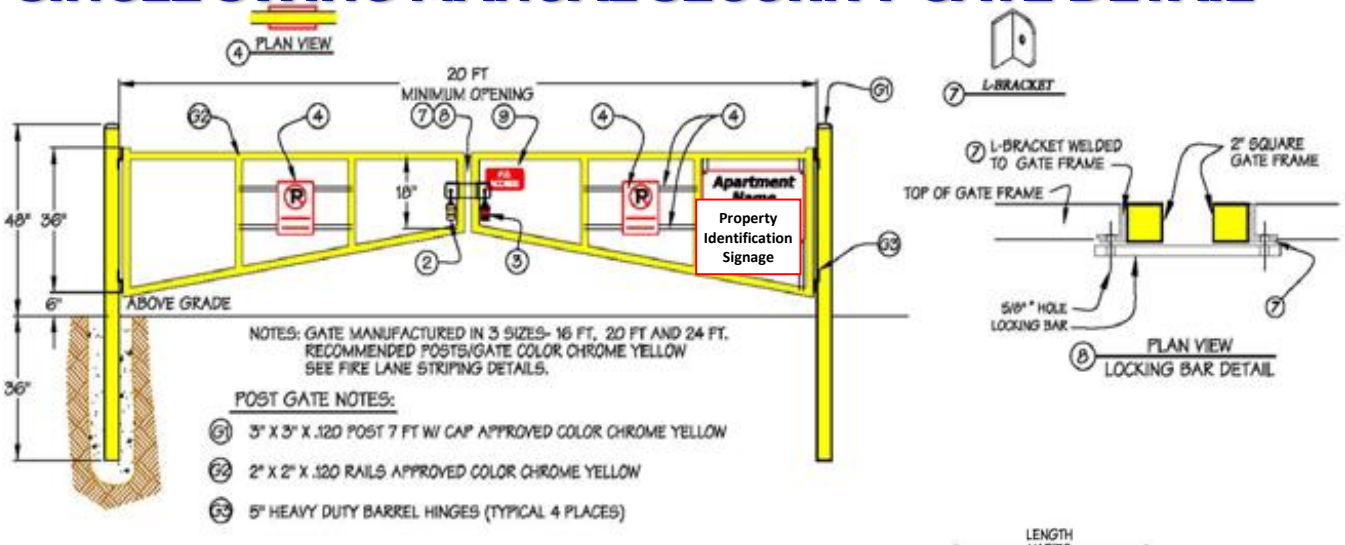
1. The sign face shall be a minimum of 18” x 24” with a maximum of 24” x 36” and fabricated from .080 aluminum sheet with 1 ½” radius corners.
2. Font style used is Handle Gothic BT Capital font.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using translucent ink.
    c. Both processes (a or b) will accomplish a colored field with white copy.
5. Signage wording and color require pre-approval by the Fire Code Official.

MANUAL CHAIN LINK SECURITY GATE DETAIL

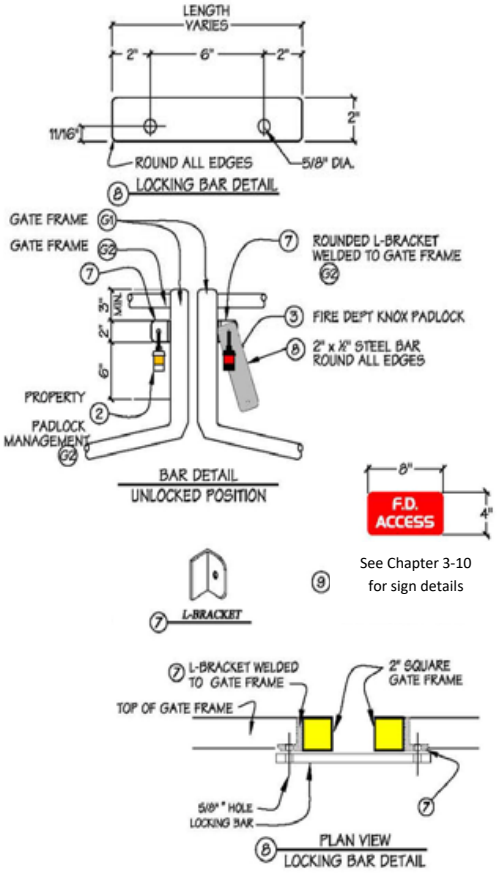


1. Approved fire lane signs with reflective background, placed back-to-back and fastened on all 4 corners. See **Chapter 2: Fire Lanes and FD Access for sign specifications.**
2. Approved Fire Department access sign with reflective background placed back to back. See **Chapter 3- 10: Fire Department Access Sign Detail for sign specifications.**
3. When required by the Fire Code Official, pavement striping shall be painted Safety Red with six (6) inch wide hash striping approximately 4 to 6 feet apart.
4. Locking bar length is determined by the frame width and gap width between the two gates. Remove all sharp edges/round all corners. Drill a minimum ¾" diameter hole. Hole diameter is determined by the padlock size.
5. Weld Modified L-bracket to gate frame.
6. The minimum overall width of the gate shall be 20 feet.
7. An approved **KNOX PADLOCK SERIES #3781 or 3782** shall be accessible from both sides of the gate (entrance & exit). See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox padlock information and ordering.

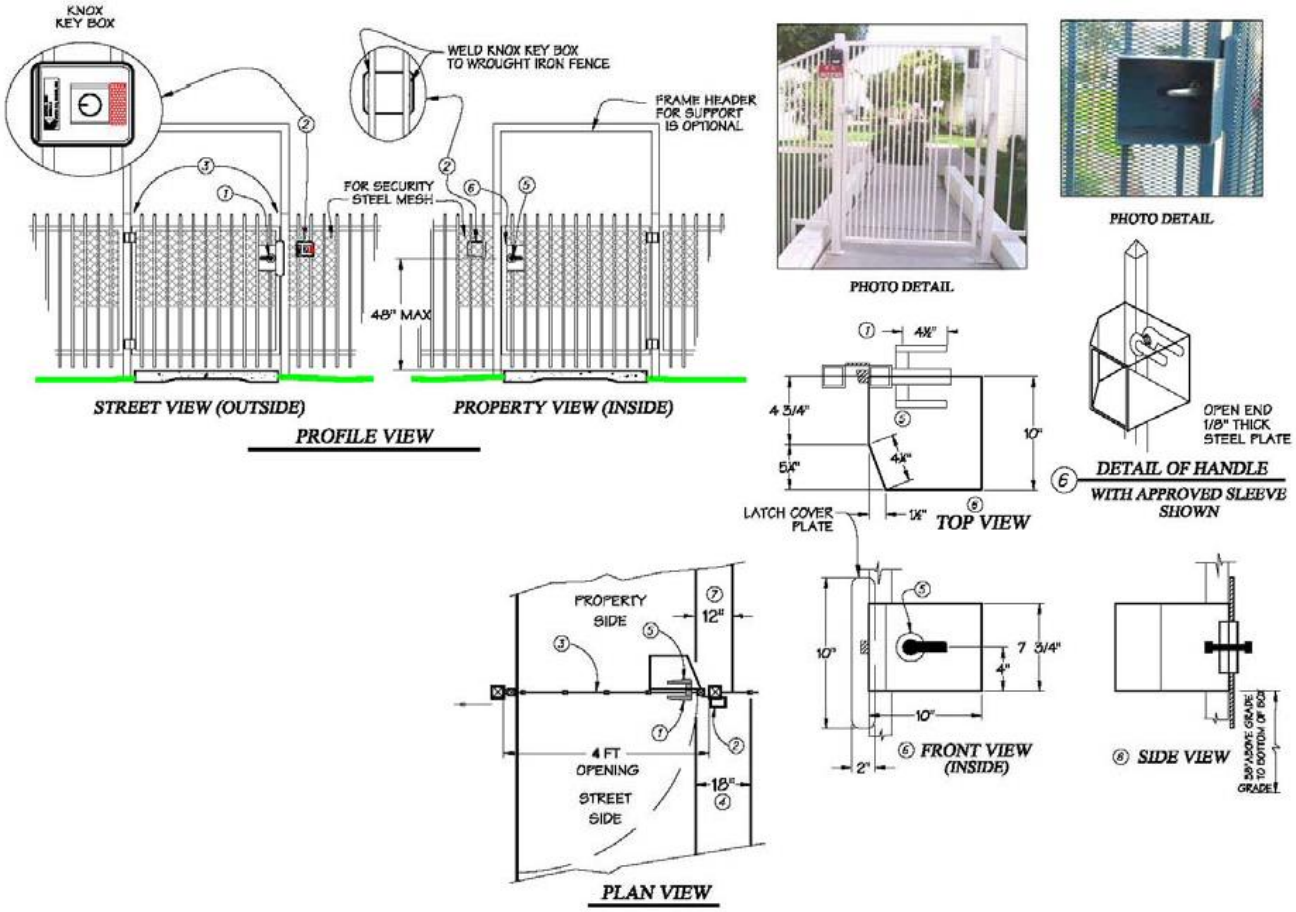
SINGLE SWING MANUAL SECURITY GATE DETAIL



1. When required by the Fire Code Official, provide an approved sign, with reflective background, to identify the name of the complex or property and the location of the access entrance. See **Chapter 7-6: Property Identification Access Sign Sample Detail** for sign specifications. Sign requires pre-approval by the Fire Code Official.
2. Property owner / management padlock.
3. An approved **KNOX PADLOCK SERIES #3781 or 3782** shall be accessible from both sides of the gate (entrance & exit). See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox padlock information and ordering.
4. Approved Fire Lane signs with reflective background, placed back to back, and fastened on all four corners. See **Chapter 2: Fire Lanes and FD Access** for sign specifications.
5. The minimum overall width of the gate opening shall be 20 feet.
6. Approved Fire Department access sign with reflective background placed back-to-back. See **Chapter 3-10: Fire Department Access Sign Detail** for sign specifications.



APPROVED PEDESTRIAN GATE REQUIREMENTS



Street side requirements:

1. Locking device on gate must operate with a key. Lock must face the street side.
2. Key to lock must be placed in an approved **KNOX BOX SERIES #3200** key box. Knox box must be welded on fence picket facing street. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox box information and ordering.
3. The minimum overall width of gate opening shall be 4 feet.

Property side requirements:

1. Gate must enable exiting **without a key** or special knowledge.
2. An approved protection sleeve may be placed over the lever handle.
3. Width of concrete pad should be increased by 12 inches if the gate has a closer.

KNOX BOX PLACEMENT FOR PEDESTRIAN GATES





1. Primary access points that have pedestrian gates require Fire Department access. Access may be provided using a **KNOX KEY SWITCH SERIES #3500** for electric gates or a **KNOX BOX SERIES #3200** key box for manual gates. See **Chapter 4: Knox Boxes, Key Switches, Etc.** for Knox box information and ordering.

2. The Fire Department will determine the final placement and number of Knox boxes required.

CHAPTER EIGHT

Hazardous Materials Identification

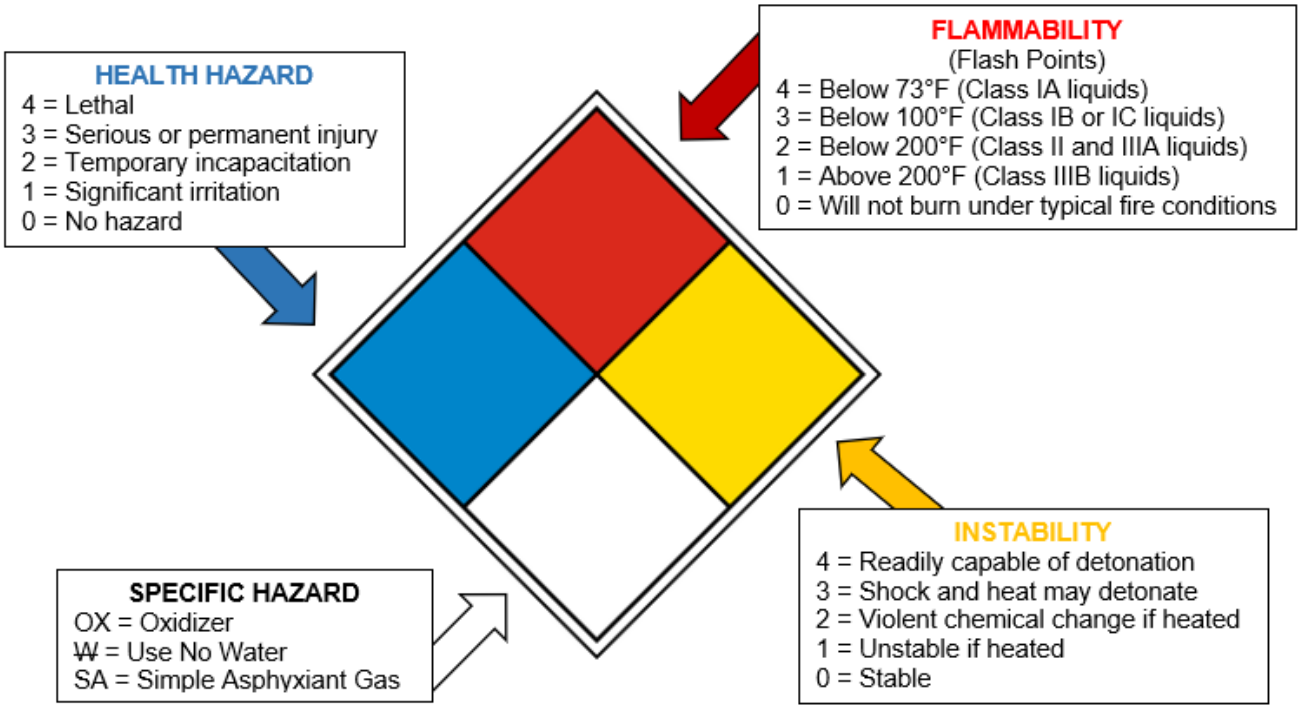
Contents:

- 704 Fire Diamonds
- HAZ MAT ID Signage

Purpose:

Emergency responders must be aware of any Hazardous Materials involved in any emergency. This signage will help protect emergency responders by identifying hazard types in locations where hazardous materials exist.

HAZARDOUS MATERIALS IDENTIFICATION
(NFPA 704 FIRE DIAMOND)



1. The sign plate shall be square with a thickness of .080 aluminum construction with radius corners. Size to be determined by the Fire Inspector or Fire Code Official.
2. The sign face shall have a reflective vinyl background.
3. Font style used – Numbers: Helvetica bold extended letters: Helvetica black BT.
4. Numbers shall be a minimum of 5 ¾ inches high with 1 1/8-inch stroke width lettering for white special hazard box shall be minimum of 2 inches high with 6/16-inch stroke.
5. Numbers and letters shall be black.
6. Signs shall be posted at locations as required and approved by the Corona de Tucson Fire District.

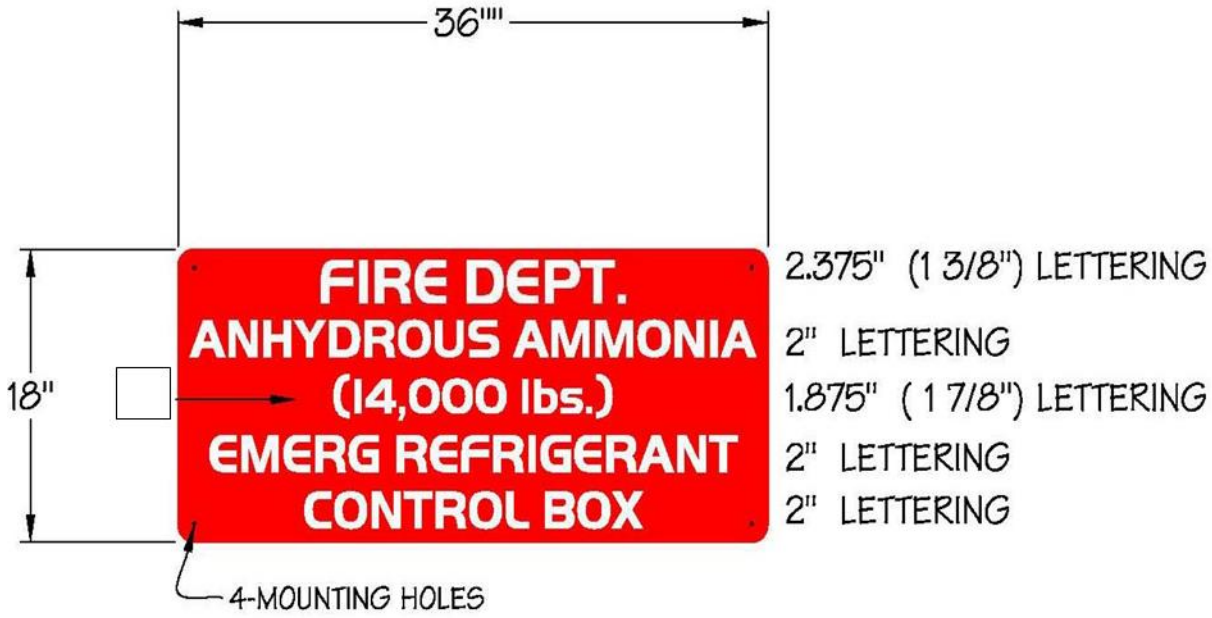
NFPA 704 PLACARD EXAMPLES





FIRE DEPARTMENT SPECIAL APPLICATION

HAZ MAT SIGN



1. The sign plate shall be a minimum of 36x18 inches with a thickness of .080 aluminum construction with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background.
4. Lettering/Graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.
5. Additional kerning between letters as shown.
6. Number of pounds changes according to system.

CHAPTER NINE

Carbon Dioxide (CO_2) Systems

Contents:

- Required Permits and Submittal Requirements
- Ventilation and Detection Requirements
- Beverage Dispensing Applications

Purpose:

Proper installation of CO_2 systems helps to protect the safety of everyone encountering these potentially life-threatening systems.

WHAT IS CO_2?

Carbon dioxide (CO_2) is a colorless, odorless, inert gas with a density that is heavier than air. When compressed and cooled to less than 87.8°F, gaseous CO_2 becomes liquified. CO_2 will remain in liquid form, regardless of the pressure applied, provided that its temperature is maintained below that critical point. Once the temperature rises above 87.8°F, CO_2 will return to a gaseous state.

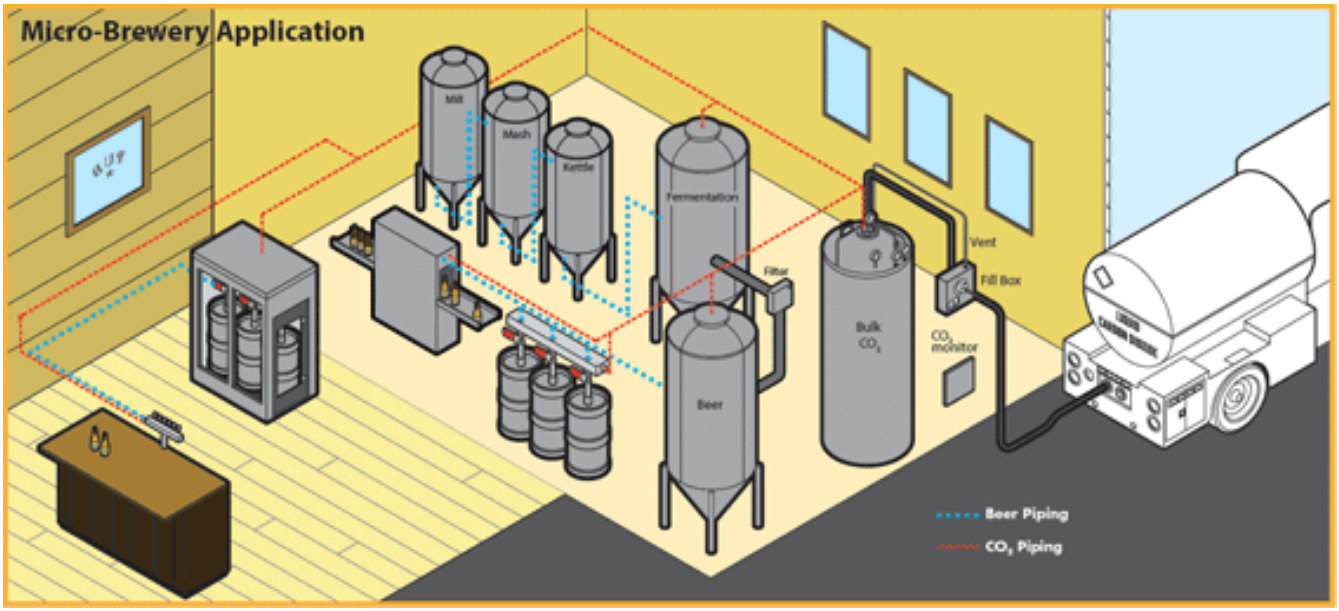
When in a gaseous state, CO_2 can accumulate in hazardous amounts in low lying areas without sufficient ventilation, especially inside confined spaces. High concentrations can displace oxygen in air and cause suffocation.

USE OF LIQUID CO_2 SYSTEMS

Because liquid CO_2 is routinely used to carbonate beverages, liquid CO_2 systems are commonly found in assembly occupancies, especially restaurants and micro-breweries. This is cause for concern because frequently owners, managers, staff, and patrons of these establishments are unaware of the associated risks with these systems. Some vendors have also installed systems without involving the building or fire department, therefore, compliance with applicable codes is called into question. Additionally, it is important for emergency responders to have advance knowledge of where these systems are located in the event of an emergency.

Requirements of this document shall be applied retroactively to existing systems within 12 months of discovery or annexation into Corona de Tucson Fire District boundaries.

Requirements of this document do not apply to systems utilizing LESS THAN 100 pounds of carbon dioxide.



REQUIRED PERMITS

CONSTRUCTION PERMITS

A new alarm system or modification to existing alarm systems plan review is required to install or modify a compressed gas system utilizing carbon dioxide (CO_2) in excess of 100 pounds or 875 cubic feet at normal temperature and pressure (NTP). Depending on the location of the installation, Pima County submittals shall be routed to the appropriate location as outlined in **Chapter 1-4: Where to Submit Plans** in the Corona de Tucson Fire District Fire Code Construction and Development Handbook. See **Chapter 9-11** of this document for permit submittal requirements.

CODES and STANDARDS

Design and installation shall comply with the applicable provisions of the following codes and standards:

- 2024 International Fire Code (IFC) Sections 916 and 5307
- Corona de Tucson Fire District IFC Amendments
- 2022 NFPA 72: National Fire Alarm and Signaling Code

GENERAL CARBON DIOXIDE SYSTEM REQUIREMENTS

The following requirements apply to all compressed gas systems utilizing CO_2:

1. The fill port is to be piped to the outside atmosphere.
2. All venting (normal and emergency) is to be piped to the outside atmosphere.
3. When used, insulated liquid CO_2 containers are to be anchored to the slab.
4. When used, CO_2 compressed gas cylinders are to be properly secured from tipping or movement.
5. All hoses and fittings used within the systems are to be manufacturer approved.
6. Warning signs are required to be posted in accordance with this chapter.
7. A backup power source is required for all systems. Batteries are an acceptable option. Exception: backup power is not required when the system is monitored for loss of power and a trouble signal is initiated by the building's fire alarm control panel.
8. Battery backup is required for CO_2 sensors/detectors that reset to an alarm condition upon loss of primary power.
9. Inspection and testing of the gas detection system shall be conducted annually, at a minimum. Sensor calibration shall be confirmed upon installation and performed at the frequency specified by the sensor manufacturer.
10. **Any CO_2 system found to be not in good working order shall be shut down and taken out of service immediately until appropriate corrective actions are made by professional service personnel.**

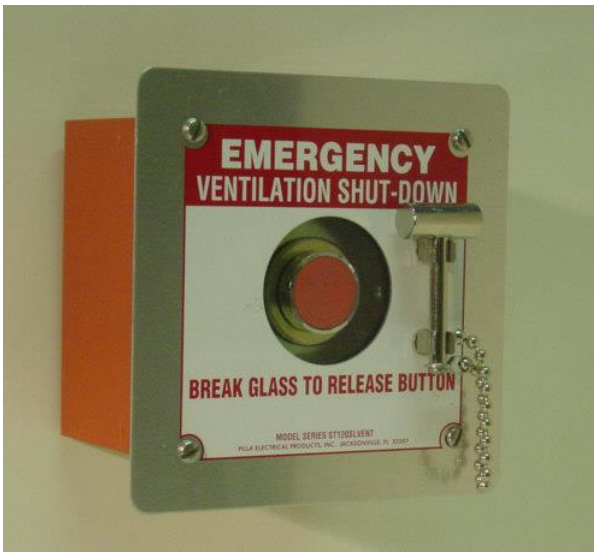
BEVERAGE DISPENSING APPLICATIONS

Mechanical Ventilation

Mechanical ventilation is required to be installed in rooms or areas indoors where insulated liquid carbon dioxide storage tanks, cylinders, piping and equipment are located and other areas where a CO_2 leak is expected to accumulate.

Mechanical ventilation systems shall be installed in compliance with the International Mechanical Code and must meet the following requirements:

1. Rooms containing CO_2 shall be maintained at a negative pressure in relation to the surrounding area.
2. Mechanical ventilation shall be at a rate of not less than 1 cubic foot per minute per square foot.
3. Systems shall operate continuously unless alternative designs are approved and system shall be operational during all times the building or space is occupied.
4. A manual shutoff control shall be provided adjacent to the access door or in another approved location. The switch shall be a break-glass type labeled VENTILATION SYSTEM EMERGENCY SHUTOFF.
5. Exhaust ventilation shall be taken from a point within 12 inches of the floor.
6. Exhaust and inlet air openings shall provide air movement across all portions of the floor or room.
7. Exhaust air shall not be recirculated.



A gas detection system installed in compliance with the International Fire Code may be installed in lieu of mechanical ventilation.

BEVERAGE DISPENSING APPLICATIONS

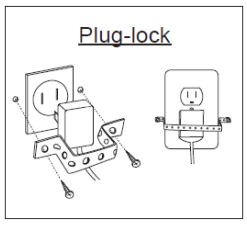
Gas Detection Systems

When mechanical ventilation requirements are not met, a gas detection system shall be provided.

Gas detection systems shall meet with following requirements:

1. Detection shall be provided in rooms, indoor areas and below-grade outdoor areas with insulated carbon dioxide systems.
2. CO_2 sensors shall be installed within 12 inches of the floor at all points of use areas where the gas is expected to accumulate or where leaks are most likely to occur. These areas include, but may not be limited to:
   - All storage and/or supply areas with CO_2 containers, tanks or cylinders
   - Areas where pure CO_2 is piped into the building
   - All mixing areas
   - Other approved locations
3. Gas sampling shall be continuous.
4. A local alarm and strobe are to be provided in each room or area where sensors are located to provide audible and visible notification of an alarm condition. An additional notification appliance is required in an area occupied by members of the public (i.e. dining room).
   - Strobes shall have a minimum candela rating of 110 with an **amber** lens installed.
   - Alarm devices shall provide a minimum of 75 decibels at 10 feet.
5. A Central Unit or CO_2 system annunciator shall be installed in a normally attended location where all alerts and tones can be heard, and all installed sensors must report to one central unit or annunciator.
6. Gas detection systems shall be permanently connected to the building's power supply with the electrical circuit for the CO_2 detection system labeled and locked or power cords shall be connected to unswitched receptacles using approved, fixed restraints to secure the plug from tampering or accidental disruption of power.







BEVERAGE DISPENSING APPLICATIONS

Alarm Conditions and Monitoring

1. CO_2 concentration of **5,000 ppm or .5%** shall activate an audible and visible **supervisory alarm** in a normally attended location (CO_2 system annunciator).

2. CO_2 concentration of **30,000 ppm or 3%** shall activate audible and visible alarms **initiating evacuation** of the building (CO_2 alarm with amber strobe).





ALARM SYSTEM COMPONENTS



Strobe with Amber Lens



CO_2 Sensor/Detector



Central Unit or Annunciator

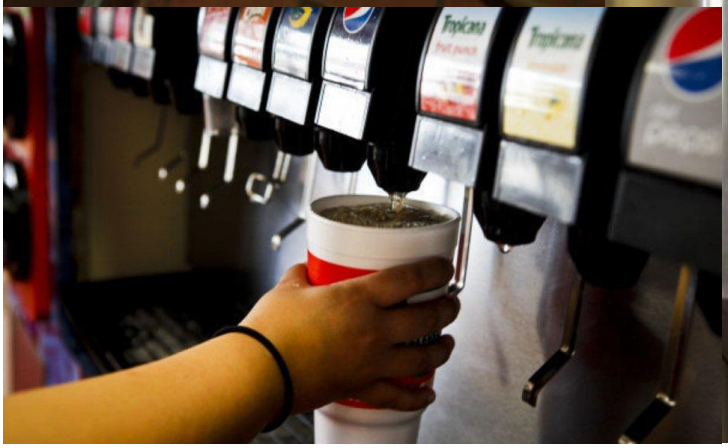
SENSOR INSTALLATION LOCATIONS

Points of Use/Mixing Areas









SENSOR AND ALARM LOCATIONS

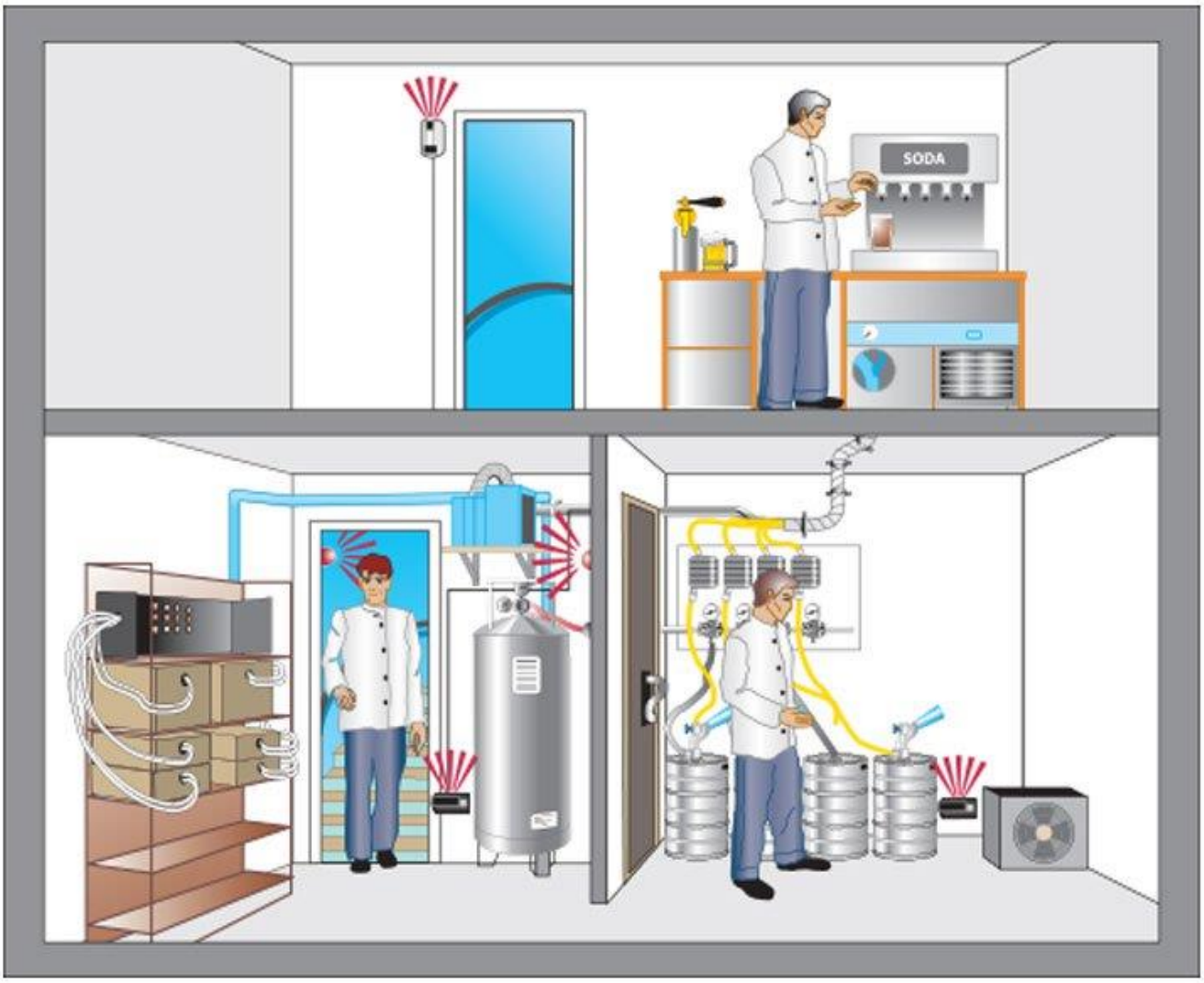
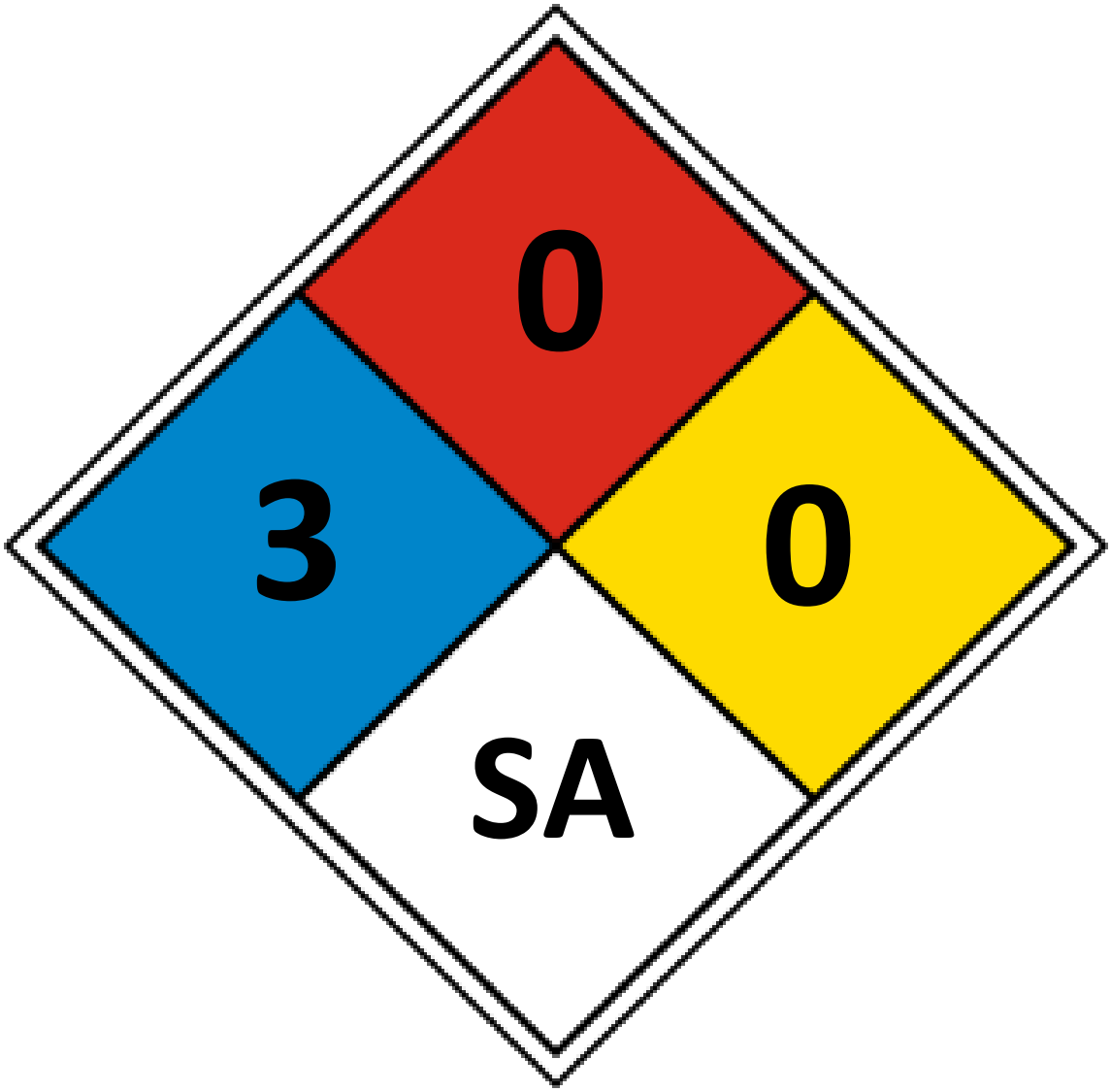


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HAZARD IDENTIFICATION SIGNAGE

Where liquid CO_2 containers are located in buildings, NFPA 704 placards displaying the hazard ratings shown below shall be posted at specific entrances (e.g. exterior doors closest to tanks, storage rooms doors) as determined by the fire code official.

See **Chapter 8: Hazardous Material Identification** for sign specifications.



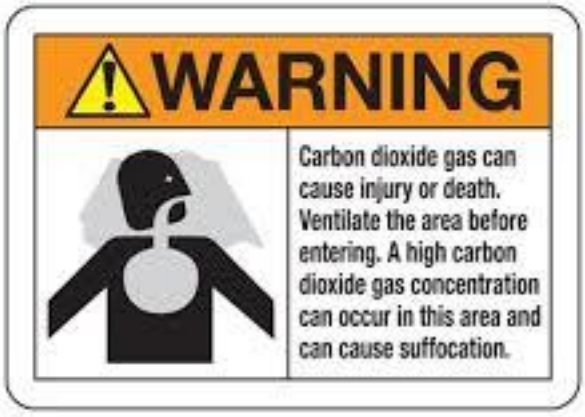
WARNING SIGNS

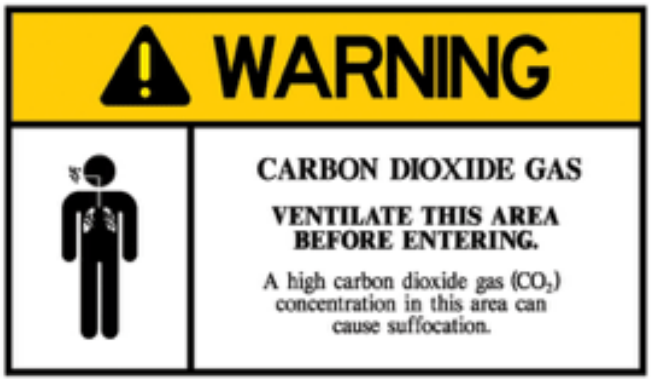
A warning sign shall be placed next to each audible/visual notification appliance.





A warning sign shall also be placed at the entrance to the room where CO_2 tanks are located. Signs shall be a minimum of 7"H by 10" W.





PERMIT SUBMITTAL REQUIREMENTS

The following items are required to be provided when submitting plans for review. Incomplete submittals will not be accepted.

1. Floor plan of the building showing the following components:
    a. When CO_2 is supplied from a bulk CO_2 system for use inside of a building, provide one of the following with the submittal:
        i. Plans for the mechanical ventilation system including calculations and electrical connections OR
        ii. Plans for the CO_2 Gas Detection System showing the following items:
            1. Locations of CO_2 Alarm Components:
                a. CO_2 sensor/detectors
                b. CO_2 audible/visible alarms
                c. Central unit or annunciator
    b. Location of CO_2 tanks or cylinders
    c. Mixing station location(s) and valves
    d. Fill port location
    e. Locations of required warning signage
2. Data sheets for all major components
3. Completed permit applications for each contractor:
    a. CO_2 System Installer

CHAPTER TEN

Residential Standpipes

Contents:

- Residential Standpipe Applications
- Required Permit and Plan Submittals
- Design Specifications

Purpose:

The installation of standpipes is essential for residential properties with access challenges such as unusually long driveways or steep slopes to prevent a delay in firefighting operations.

WHAT IS A RESIDENTIAL STANDPIPE?

Residential standpipe systems are essentially an extension of a fire hydrant system consisting of pre-plumbed piping that connects a water supply to hose connections. These systems are used by firefighters to avoid the exertion and delay from dragging large diameter hoses for long distances or traveling up steep slopes. One end of the standpipe system, with female threaded connections, is located so that an engine can pump into the pipe. The other end (or ends) will be located at key positions around the home or site with multiple outlet male connections, each with a valve. One or more standpipes may be needed to reach within 150' of all points of the home.

WHEN ARE RESIDENTIAL STANDPIPES REQUIRED?

Driveways for residential structures greater than 200 feet in length shall comply with section 512.1 of the 2024 International Fire Code (IFC) as amended by Corona de Tucson Fire District :

- 512.1 General. Driveways exceeding 200 feet (60,960 mm) in length shall provide a minimum unobstructed width of 14 feet (4,267 mm) and a minimum unobstructed height of 13 feet 6 inches (4,115 mm). Such driveways shall not exceed 10 percent in grade.

Through an amendment to the 2018 IFC, CDTFD defines a driveway as follows:

- DRIVEWAY. A vehicular ingress and egress route that connects a building or structure to a fire department access road.

When the construction of a driveway cannot comply with CDTFD specifications, a residential standpipe may be installed as an acceptable alternative method to overcome the driveway deficiency. If the design option of the residential standpipe is chosen, the following requirements apply to its design, construction, and approval.

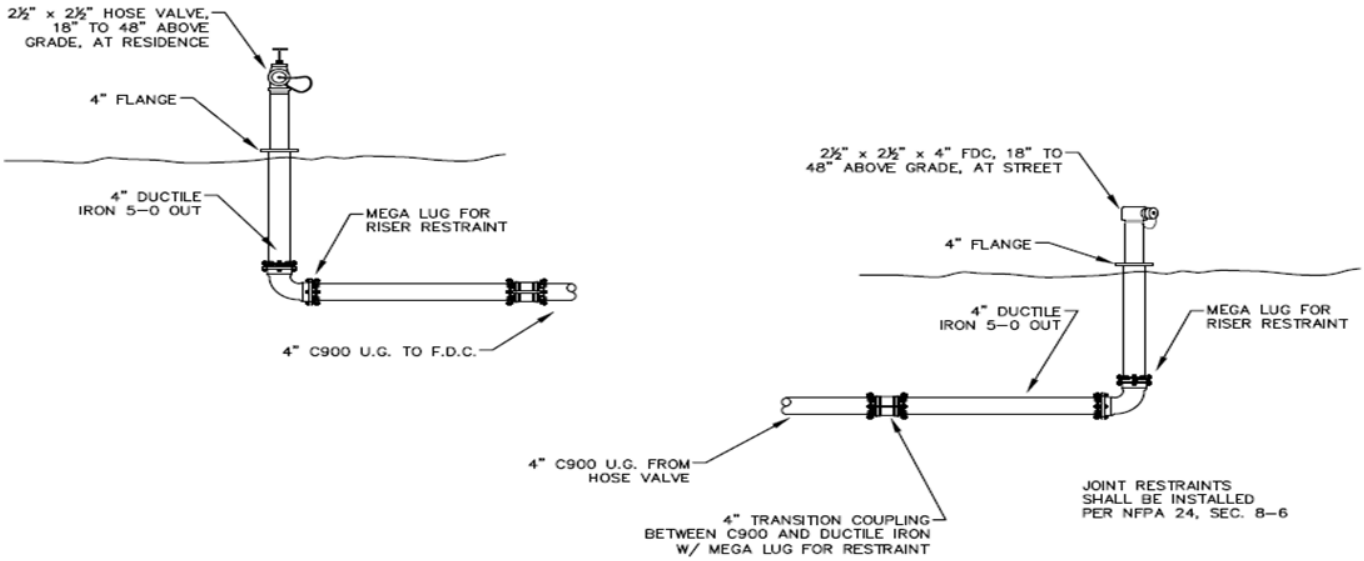




RESIDENTIAL STANDPIPE SPECIFICATIONS

1. A minimum of 4-inch diameter piping system shall be used.
2. All piping installed must conform to NFPA 24, 2022 edition, Table 10.1.1.1 Manufacturing Standards for Underground Pipe. Examples of acceptable piping materials include ductile iron, steel, concrete, PVC C-900 or copper.
3. Thrust blocks or equivalent listed joint restraint systems are to be used at every turn greater than 45 degrees.
4. A Siamese connection consisting of two-2½ inch National Standard Thread (NST), plugged female inlets are required on the fire department access end of the standpipe.
5. One-2 ½ inch NST male connection with a valve is required on the residence's end of the standpipe.
6. Piping must be buried or protected in accordance with NFPA 24, 2022 edition, 10.4 Protection of Private Service Fire Mains.
7. Height of connections shall be a minimum of 18 inches and a maximum of 48 inches above the finished grade.
8. Standpipe risers shall require an elbow to provide horizontal orientation and may require stabilization.
9. Vehicle protection guards, if required, shall consist of at least two posts, spaced 4 feet apart and 3 feet from the standpipe. The minimum post design shall be a 4-inch diameter schedule 40 steel pipe filled with concrete and imbedded in an 18-inch diameter concrete footing, a minimum of 36 inches deep.

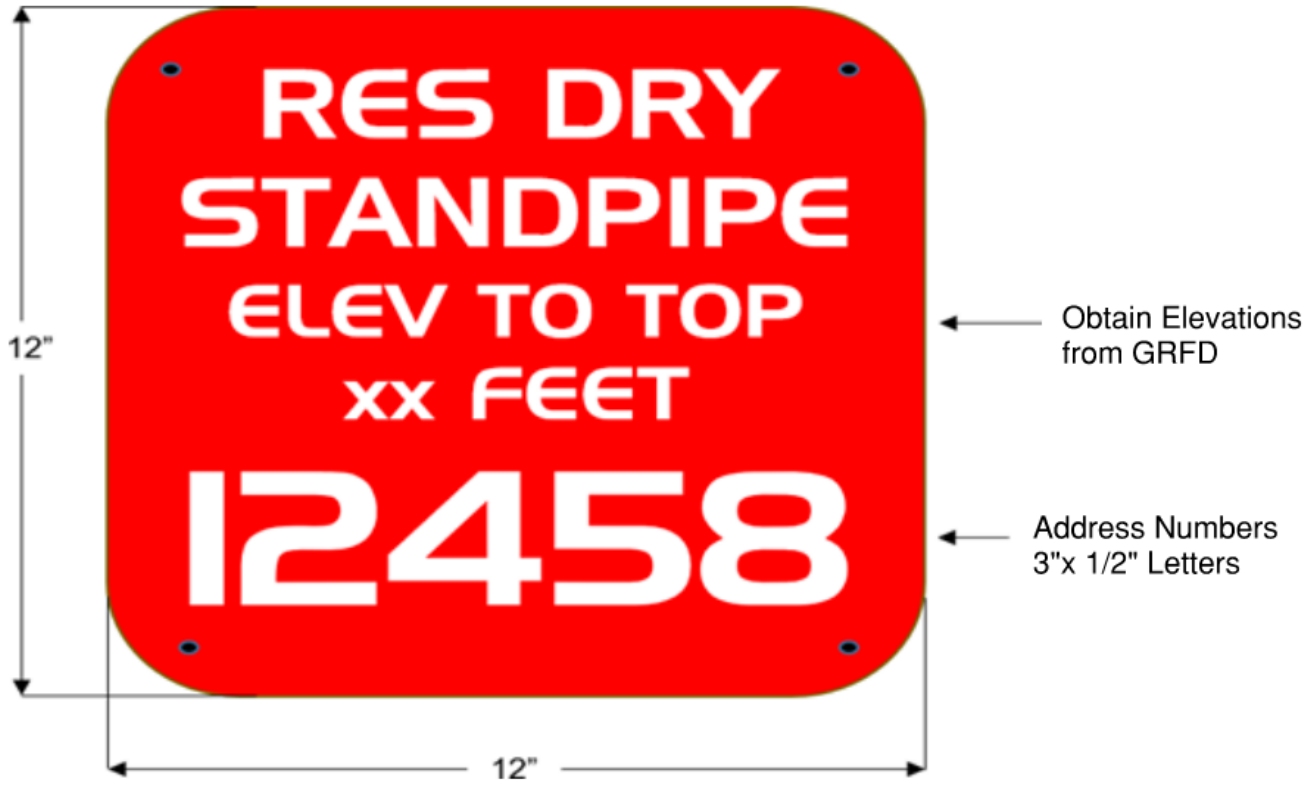
TYPICAL STANDPIPE DESIGNS

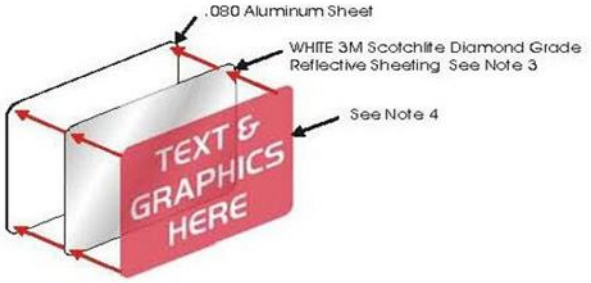


A FP1 DRY STANDPIPE DETAIL

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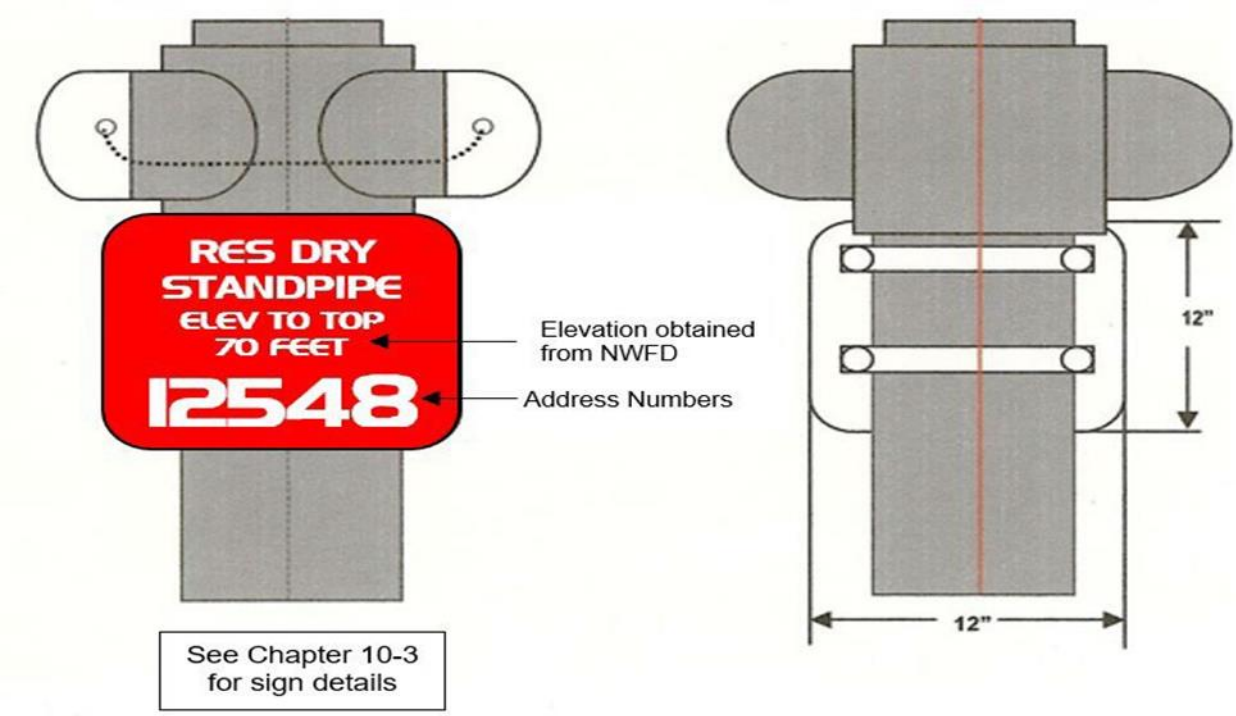
RESIDENTIAL STANDPIPE SIGN DETAIL



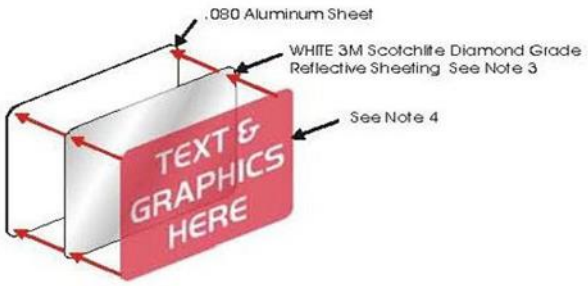


1. The sign plate shall be a minimum size of 12X12 inches and fabricated from .080 aluminum sheet with 1½ inch radius corners.
2. Font style is Handel Gothic capital fonts.
3. The sign face shall have white 3M diamond-grade reflective sheeting 3990 series VIP, type IX) applied as a background.
4. Lettering/graphics shall be one of the following:
    a. 3M Scotchlite electronic transparent cuttable film (1170 series) inverse cut to allow white reflective background to show through lettering.
    b. Screen printed using 3M 8801 series red translucent ink.
    c. Both processes (a or b) will accomplish a red field with white copy.
5. Alternate sign color may be used when approved by the Fire Code Official

RESIDENTIAL STANDPIPE SIGN DETAIL



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2. Font style is Handel Gothic capital fonts.

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c. Both processes (a or b) will accomplish a red field with white copy.

5. Alternate sign color may be used when approved by the Fire Code Official

PLAN SUBMITTALS AND INSPECTIONS

Submit plans to the Corona de Tucson Fire District for review and approval. Show location of risers, piping, and burial depth. Plans must specify all the materials to be used for construction of the residential standpipe system.

REQUIRED INSPECTIONS

1. Pre-burial underground piping and thrust-block inspection.
2. Hydrostatic pressure test. Underground piping must maintain a pressure of 200 psi measured at the lowest point in the system for a minimum of two (2) hours.
3. Flush - Piping shall be flushed prior to final acceptance. Contact Corona de Tucson Fire District to arrange flush.