



# CHAPTER SEVEN

## Automatic Gates

### **Contents:**

- Steps to Obtain Permits
- Installation Requirements
- Electrical Requirements
- Gate Construction
- Key Switch Placement and Installation
- Preemption
- Automatic Gate Signage

### **Purpose:**

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



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14250 W. Statler Plaza, Suite101  
623.222.5100



## **MANUAL GATE GENERAL NOTES**

1. All manual gates shall use an approved padlock as a locking mechanism.
2. An approved dual padlock locking bar and Fire Department padlock shall be used.
3. Six-inch wide red stripping shall be painted on the ground along the length of both sides of the gate.
4. Fire Department approved "No Parking" signs, four (4) total, two (2) shall be bolted back to back on each side of gate(s).
5. A sign that identifies the location of the property's primary entrance shall be bolted on the street side of the gate(s).
6. All clear access openings as shown on plans shall be a minimum of 20 feet. If gating an **existing** drive, the **current** width of drive must remain as the original City of Surprise approved clear access width.



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## **AUTOMATIC GATE GENERAL NOTES**

1. The automatic gate operator(s) and/or parking barrier arm(s) shown are to be equipped with battery backup.
2. The City of Surprise approved Knox Box key switch shall be used for 24-hour Fire Department access. The emergency key switch, when activated, shall by-pass any occupant control and loop systems. When activated, the gate will remain in the open position until de-activated by the Fire Department. Only when deactivated will the gate resume normal operation.
3. The key switch shall open both the entrance and exit gate(s) when gate(s) are in close proximity to each other.
4. The Knox Box key switch shall be mounted at five and one-half (5½) feet from grade. (location shown on plan)
5. The key switch shall be located below a sign labeled "FD ACCESS". The sign shall be 8X4 inches with thickness of .080 aluminum with round corners. The sign face shall have a white 3M diamond-grade reflective sheeting (3990 series VIP type IX) applied as a background. Lettering and/or 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 red field with white copy.
6. All clear openings as shown on plans shall be a minimum 20 feet clear width for **ENTRANCE** and 16 feet clear width or larger on all **EXIT** drives.
7. Gate operator(s) shall open at a rate of one foot per second. Parking barrier arms will open or clear in approximately two seconds.
8. Preemption device shall be installed on all multi-family dwellings including single-family gated communities and multi-family gated communities, per Surprise Fire Department installation requirements.



## **VEHICLE ACCESS GATE PLAN SUBMITTAL GUIDELINES**

### **Gate(s):**

- Minimum of 20-foot wide, clear access opening on **ENTRANCES** and 16-foot wide on **EXITS**.
- Turning radius shall comply with AASHTO WB-50 turning radius.

### **Automatic Gate:**

- A Fire Department approved Knox Switch is located no higher than five and one-half (5½) feet above final finished grade on **ENTRANCE** and **EXIT** side of gate
- Emergency Gate Switch will fully open both the **ENTRANCE** and **EXIT** within 15 seconds of activation and remain in the open position until closed by operation of the electrical control device
- A sign plate reading "FIRE DEPT ACCESS" shall be installed at, but no more than 12 inches from the emergency gate switch. The sign shall be a minimum of 4X8 inches, reflective background with thickness of .080 aluminum. (See page 8-12).
- Battery backup installed on **ENTRANCE** and **EXIT** gates
- Residential/multifamily gate will open on battery backup during loss of power and remain open until the power is restored (fail safe)
- Commercial/industrial properties remain closed until the emergency gate switch is activated, then open on battery backup (fail secure)
- Activated access gate shall open at a rate of one foot per second
- All multifamily housing developments including single-family homes (five or more) shall have preemption devices on each gate

### **Manual Gate:**

- All manual fire apparatus access gates shall use an approved padlock as a locking mechanism
- An approved dual padlock locking bar and **#3753 KNOX PADLOCK** shall be used. (**See Knox Box Application**).
- Six-inch wide **RED** stripping shall be painted on the ground along the length of both sides of the gate



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- Fire Department approved “No Parking” signs are bolted onto each side, back-to-back, of the gate. Signs have a reflective background and are made of .080 aluminum. (See page 1-13).
- A sign that identifies the location of the property’s primary entrance shall be bolted on the street side of the fire apparatus gate. (See page 8-7).

**ELECTRICAL INSPECTION AND APPROVAL  
MUST BE OBTAINED FROM BUILDING SAFETY DIVISION PRIOR TO FIRE  
DEPARTMENT FINAL INSPECTION.**

**GATE INSTALLATION AND MODIFICATION SHALL BE SUBJECT  
TO FINAL FIRE INSPECTION AND APPROVAL.**



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## **APPROVED ACCESS REQUIREMENTS FOR PREEMPTION DEVICES**

**Preemption devices shall be installed on all Entrances and Exits of automatic gated communities, apartments, condominiums, town homes, or when required by the Fire Code Official.**

### **Minimum Standards for Installation**

- Detectors shall be mounted eight (8) to ten (10) feet from grade
- Detectors shall be located behind the access gate (property side)
- Detectors shall be mounted on a 4X4 inch metal post, not on guidepost
- Post shall be cemented 18 inches below grade
- Detectors shall activate 150 feet from gate
- Each gate shall have two approved individual Tomar detectors or an approved **Tomar Dual Strobeswitch, model 2795-2**
- Detectors shall point toward the **APPROACH** and **EXIT** path of the emergency vehicle
- Detectors' sight path shall be free of visual obstructions such as signs, covered parking canopies, and vegetation
- 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
- Knox Key Switches shall be provided as a manual backup
- The entrance Knox switch shall be located above the residence's keypad, 5½ feet above grade, with the detectors
- The exit Knox Key Switch shall be located on the 4X4 inch preemption post, **recessed** 5½ feet above grade, with the detectors



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## VEHICLE ACCESS GATE PLAN GUIDELINES

The following general information needs to be provided with the plan submittal:

1. No landscaping shall obstruct the sight path of preemption detectors.
  - Submit **two** (2) sets of plans at **Community Development Counter**
  - Submit completed permit application at **Community Development Counter**
  - Submit gate locations and details on site plan for TAC approval for review of Fire Department and Planning & Zoning approvals
  - Identify the number of gates to be installed
  - Name and address of the installing contractor
  - New contractors will need to supply the following:
    - Contractor's license(s)
    - State Privilege number
    - City of Surprise business license
  - On manual gates **ONLY**, the owner may be listed as the contractor
  - Location, including the street address, floor, and/or suite number
  - Site plan, showing orientation to streets, property line and point of compass
  - Scale of drawing and a graphic representation of scale
  - Drawing should be legible and dedicated to the specific system being installed (Vehicle Access Gates)
  - Electrical inspection and approval must be obtained prior to the final fire inspection
  - Stamped, approved plans permit must be on site for all inspections



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## **ITEMS NEEDED 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. 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**(¾ inch or larger conduit is recommended for best results)**
4. It is recommended to run two conduits to each device. When low voltage and 110-volt are run in the same conduit (even with properly rated wire) it can cause cross talk, static and/or malfunction could occur.
5. Bury conduit minimum 24 inches under driveways and 18 inches in landscaped areas.
6. No landscaping shall 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.*



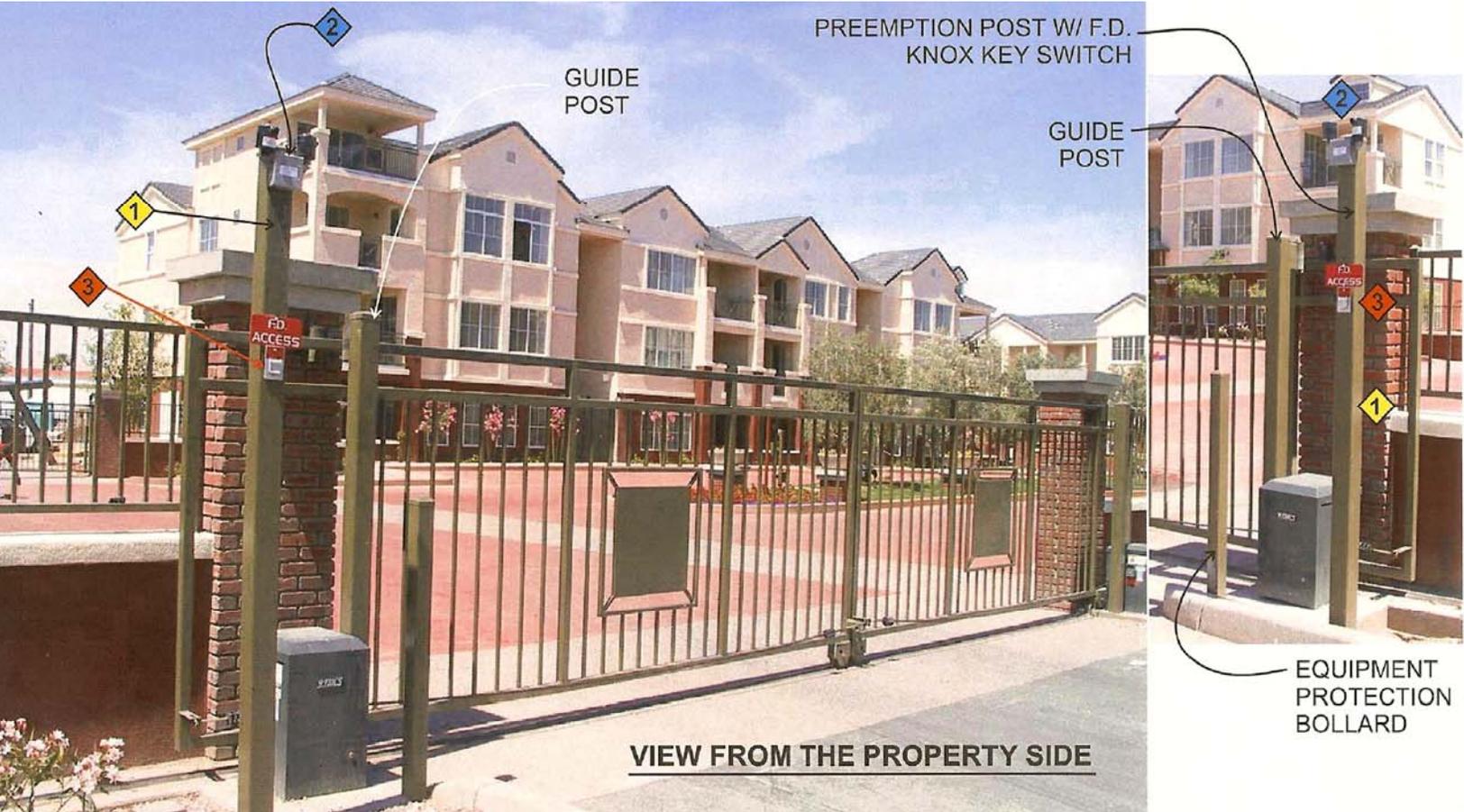
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## **ELECTRICAL REQUIREMENTS FOR NEW GATED COMMUNITIES**

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 **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. Obtain an inspection #514 for Electrical Underground for the gate that reads, **“Pass for Gate/s”**. Marking on the plans **will not** be accepted by the Fire Department. Without this, when the electrical final is done, the conduits will need to be re-exposed.
4. Have **final** electrical inspection for gates. Inspection final must read **“Final Electrical for Gates”**. **Marking this on the plans will not be accepted by the Fire Department.** A passed final inspection (#582) must be obtained **before** the gate company can call for a Fire Department Inspection.
5. Items that will be inspected for electrical final:
  - a. Electrical Underground for gate (#514)
  - b. Final Electrical Inspection for Gate (#582)
  - c. Proper Grounding
  - d. 110-volt connections
  - e. Disconnect provided within site (NEC 2005, Sec. 430 – 101, 102)

**MULTI FAMILY PREEMPTED AUTOMATIC GATE**

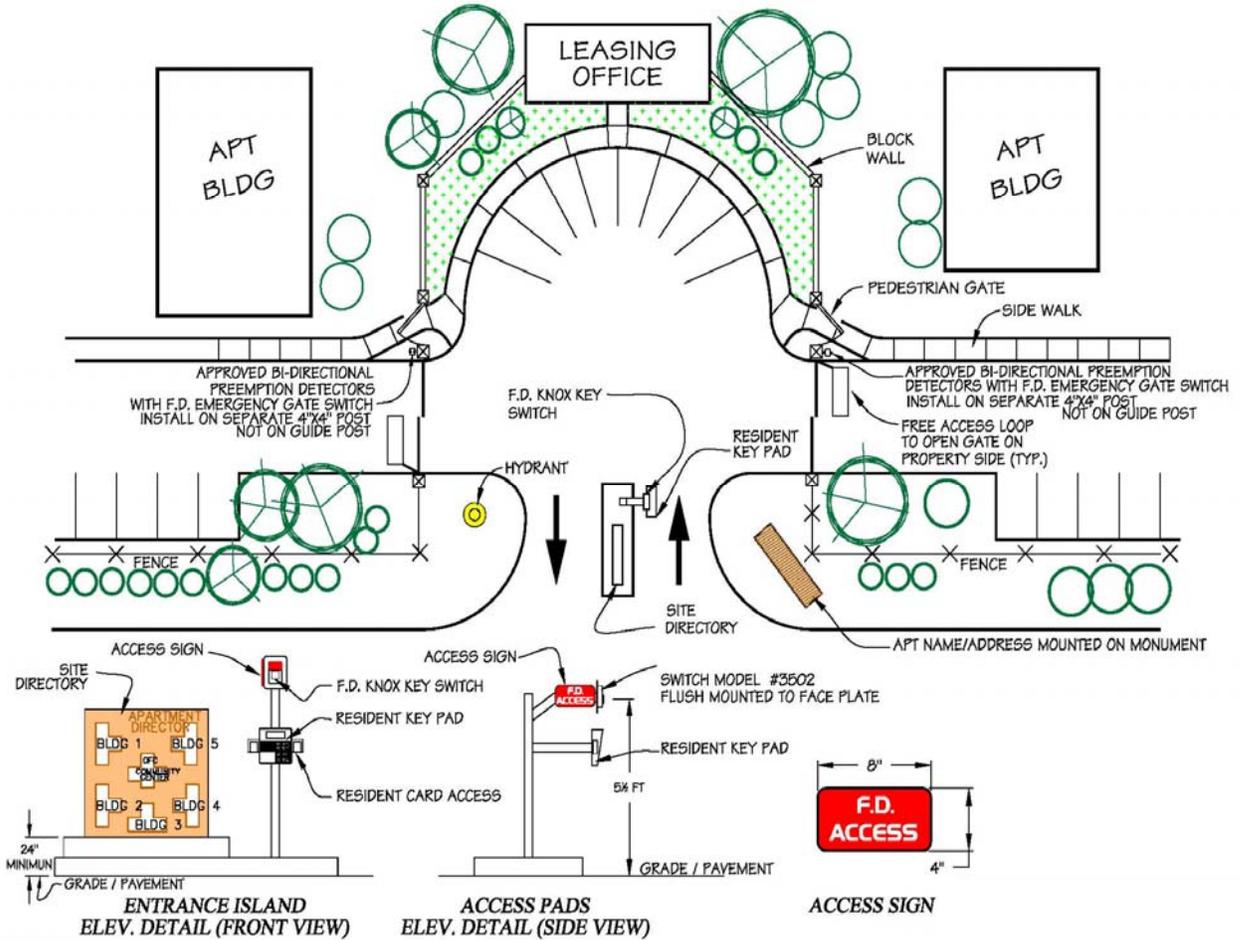


**REQUIRES PERMIT**

NOTE:

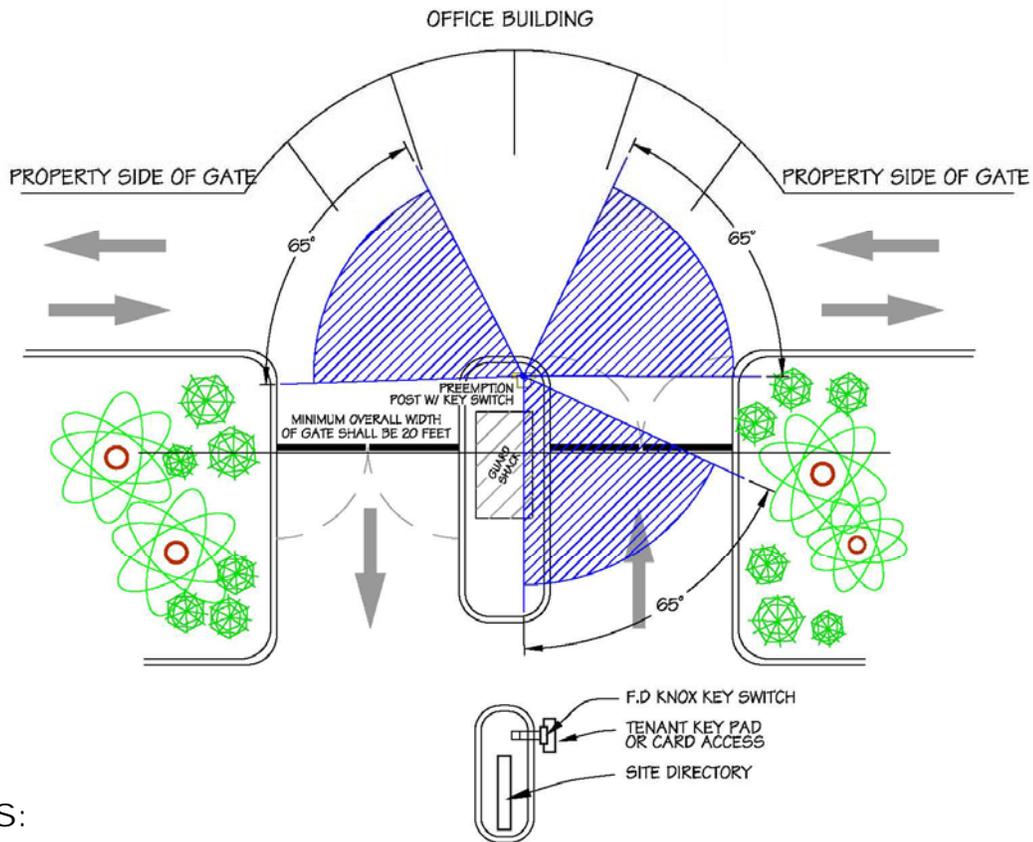
- 1.** Detectors shall be mounted on 4x4 inch post 8 feet to 10 feet above finish final grade.
- 2.** Fire Department approved Dual Strobe Switch detector model #2795-2.
- 3.** Fire Department approved Knox Key Switch model #3502 flush mounted in 4x4 inch post.

**TYPICAL ENTRANCE TO MULTIPLE RESIDENTIAL COMMUNITIES WITH AUTOMATIC GATES**



## AUTOMATIC GATE ENTRANCE WITH 3-STROBE DETECTORS

### TOMAR MODEL 2795-3

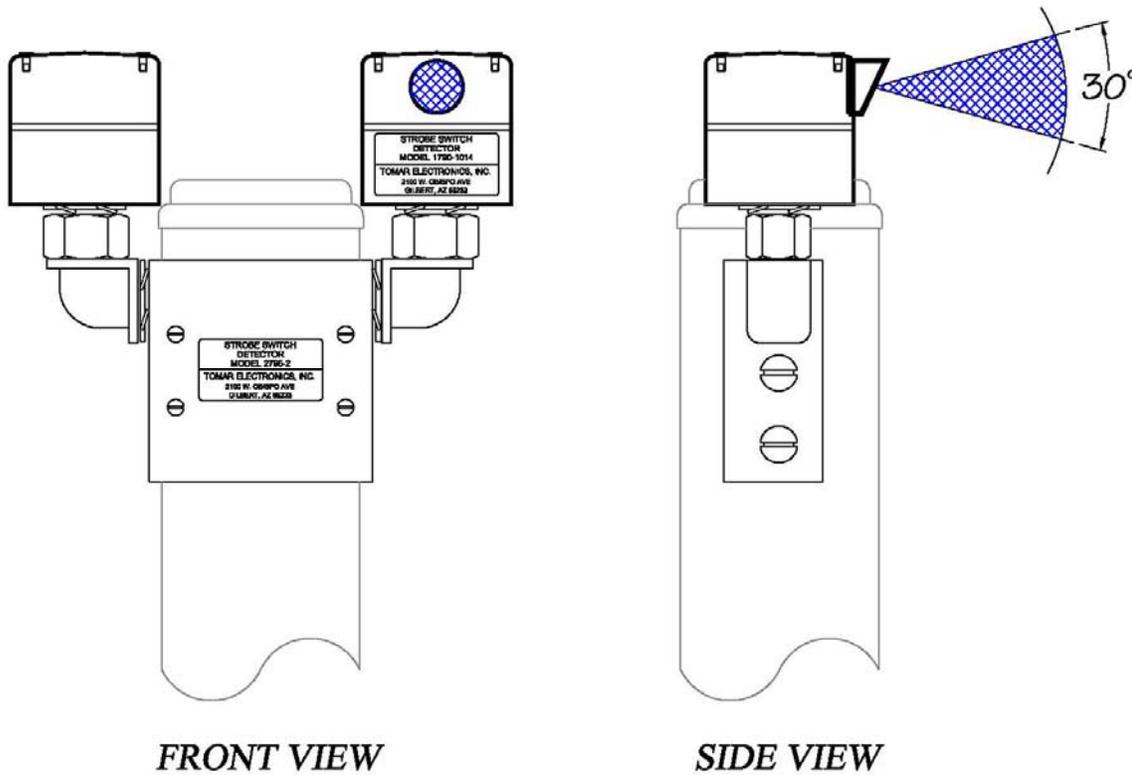
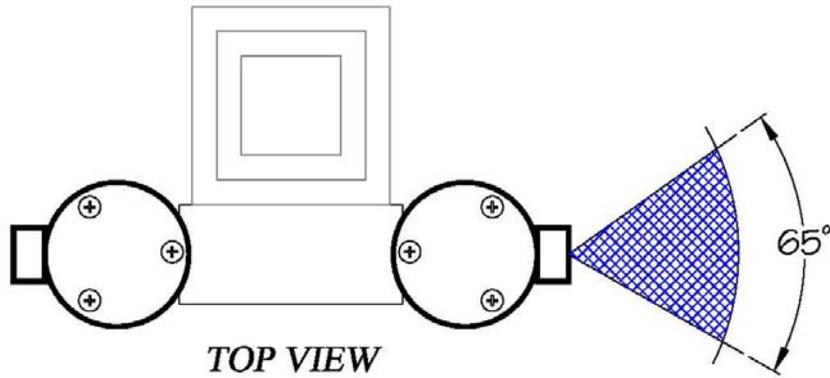


#### NOTES:

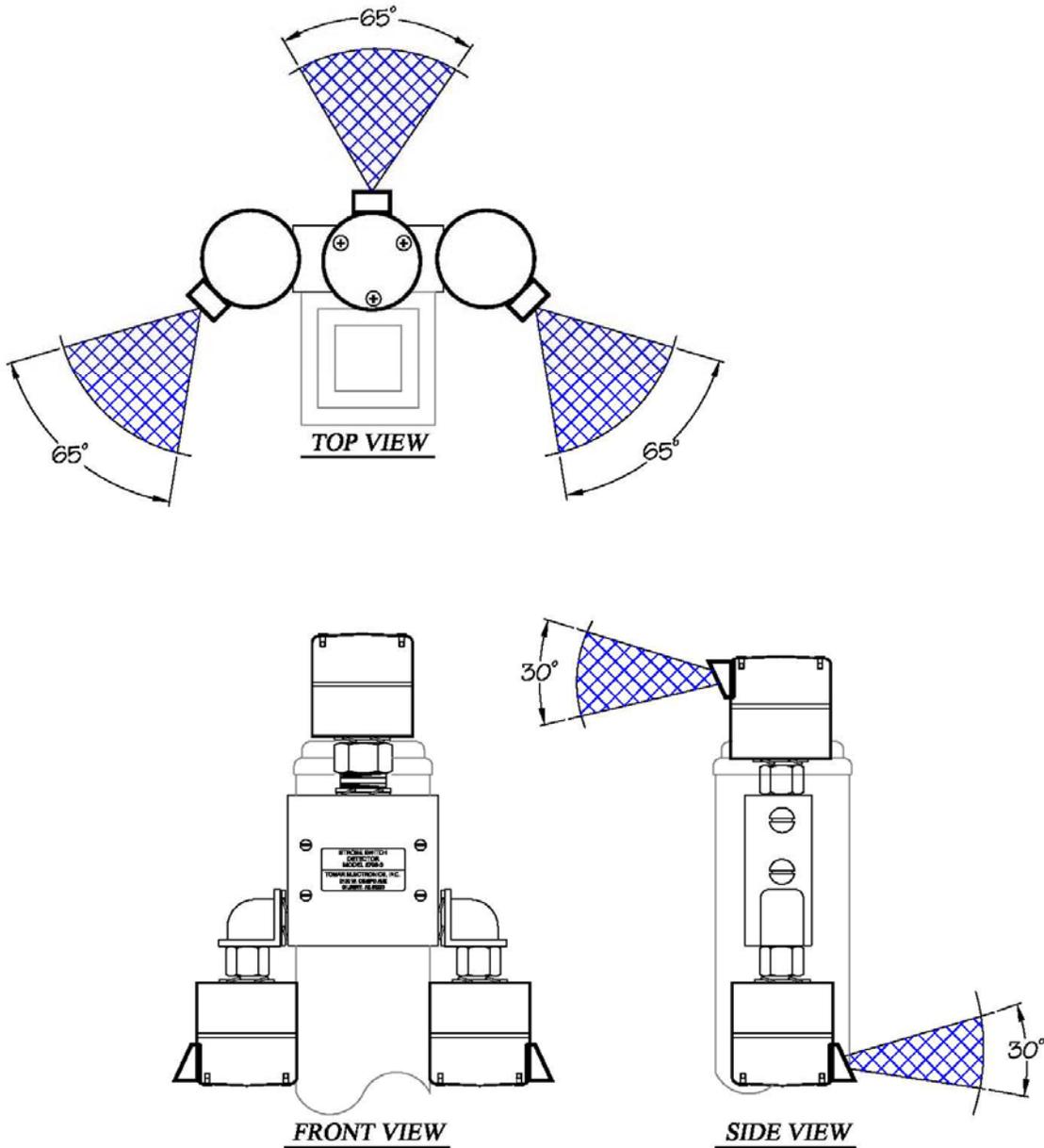
1. Detectors shall be mounted eight (8) to ten (10) feet from grade on a 4x4 inch metal post. No mirrors shall substitute the requirements of two detectors per gate.
2. Detectors shall point toward the approach path and exit path of the emergency vehicles. Detectors must activate 150 feet from gate.
3. The power module shall be mounted in an electrical junction box, under the detectors on the same 4x4 inch metal post.
4. The 4x4 inch square post with detector and power module shall be installed on the property side of the gate. (Not on guide post)
5. Approved emergency key switch shall be installed on the entrance and exit side of each access gate. Entrance switch shall be located above the residence key pad 5½ feet from grade. Exit switch shall be located on the 4x4 inch post with the dual detectors and power module unit.



**TOMAR PREEMPTION DETECTOR  
MODEL 1790-1014**



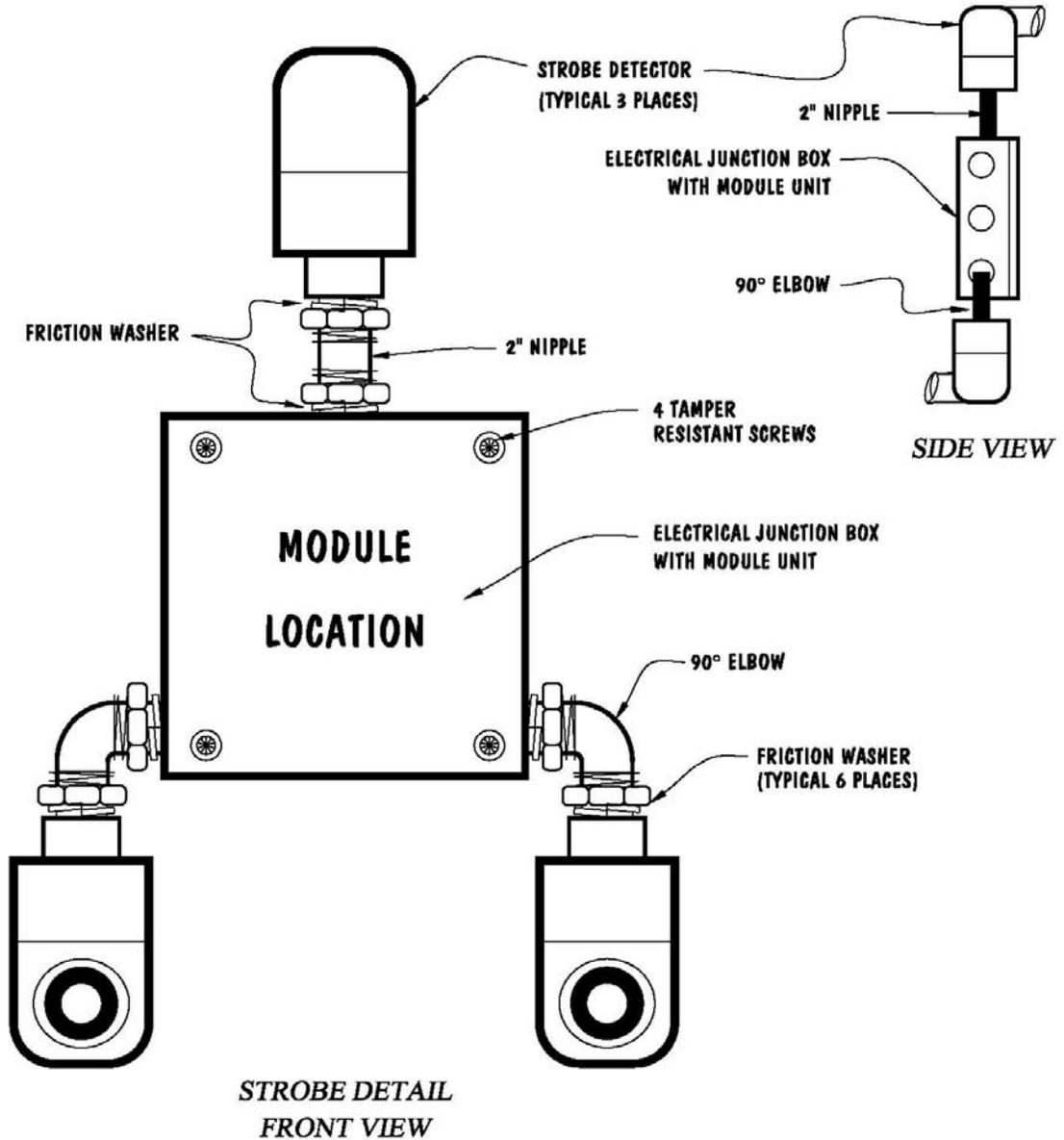
### 3 TOMAR PREEMPTION DETECTOR MODEL 2795-3



NOTE:

Three heads are required with 90 degree turning layouts.

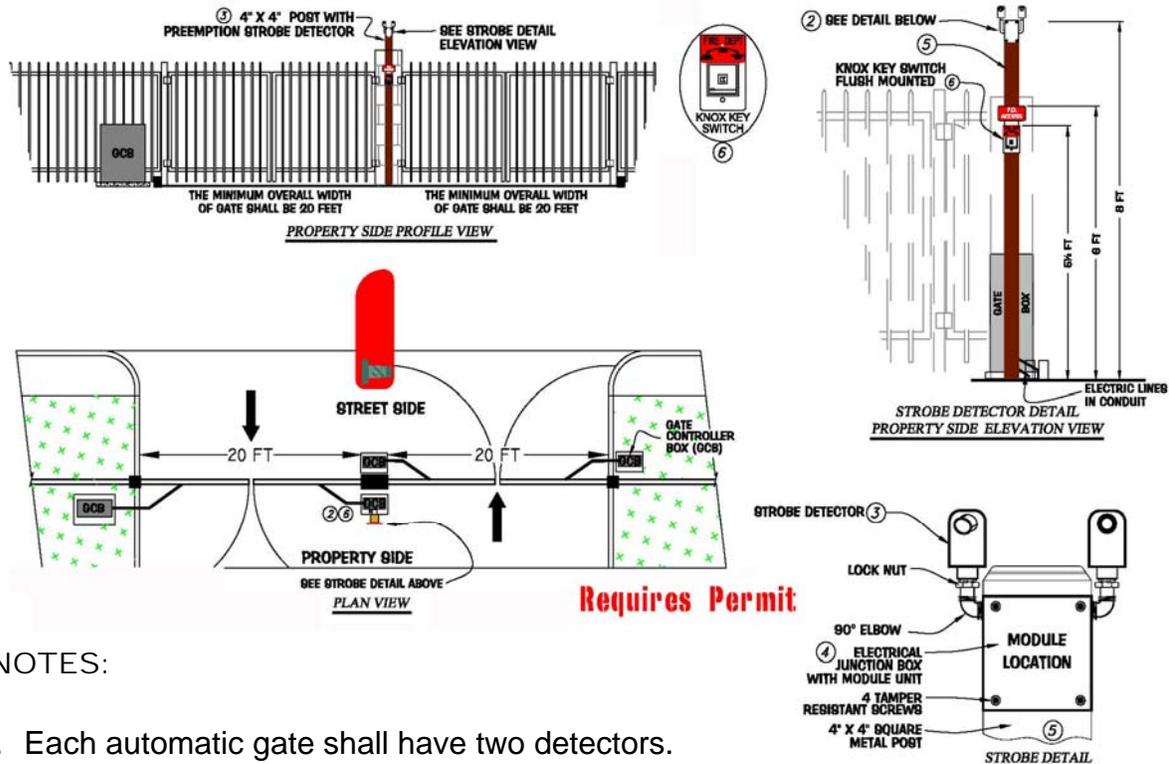
**AUTOMATIC GATE STROBE DETAIL**



NOTE:

Three heads are required with 90 degree turning layouts.

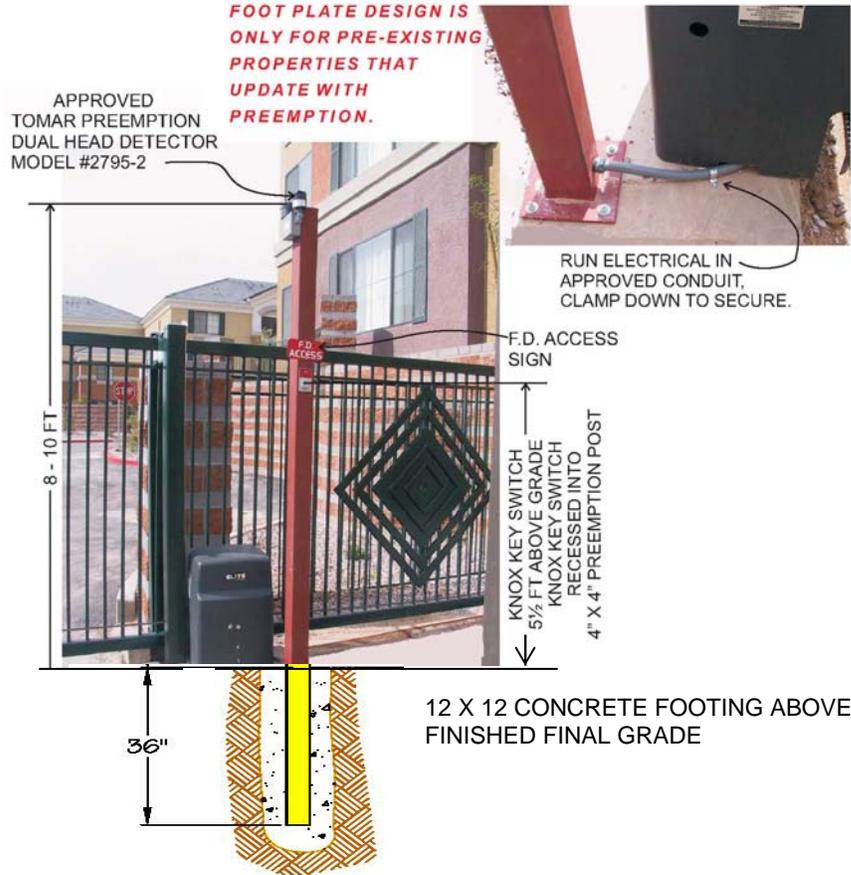
## APPROVED AUTOMATIC FIRE DEPARTMENT ACCESS GATE PREEMPTION DETECTORS WITH KNOX KEY SWITCHES



**NOTES:**

1. Each automatic gate shall have two detectors.
2. Detectors shall be mounted eight (8) to ten (10) feet from grade on a 4x4 inch metal post. No mirrors shall substitute the requirements of two detectors per gate.
3. Detectors shall point toward the approach path and exit path of emergency vehicles. Detectors must activate within 150 feet from gate.
4. The power module shall be mounted in an electrical junction box, under the detectors on the same 4x4 inch metal post.
5. The 4x4 inch square post with detector and power module shall be installed on the property side of the gate, not on guidepost.
6. Approved emergency Knox Key Switch shall be installed on the entrance and exit side of each access gate. Switch shall be located 5½ feet above grade recessed in the 4x4 inch post with dual detectors and power module unit.
7. Fire Department Knox Box order form for Knox Key Switch can be obtained at Fire Prevention, 14250 W. Statler Plaza, Suite101 or Community Development, 12425 W. Bell Road from 8:00 AM – 5:00 PM.

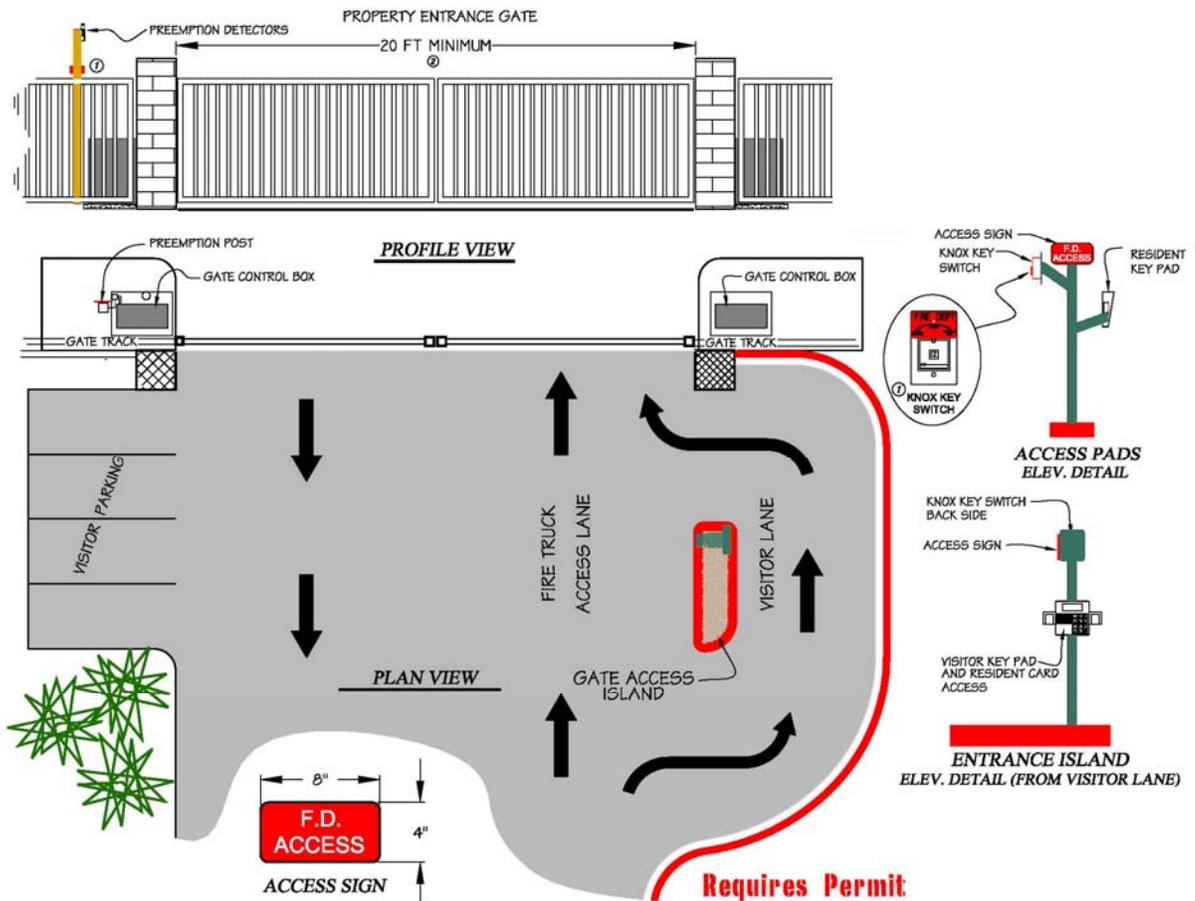
## SPECIAL APPLICATION FOR RETRO FITTING WITH PREEMPTION



### NOTES:

1. Each automatic gate shall have two detectors.
2. Detectors shall be mounted eight (8) to ten (10) feet above finish final grade on a 4x4 inch metal post. Detectors shall be on separate post, not on guide post.
3. Detectors shall point toward the approach path and exit path of the emergency vehicles. Detectors must activate within 150 feet from gate.
4. The power module shall be mounted in an electrical junction box, under the detectors on the same 4x4 metal post.
5. The 4x4 square post with detector and power module shall be installed on the property side of the gate.
6. Approved emergency Knox key switch Model #3502 shall be installed on the entrance and exit side of each access gate. Entrance switch shall be located above the residence key pad 5 1/2 feet from grade. Knox key switch shall be recessed into the 4x4 post with the dual detectors and power module unit.

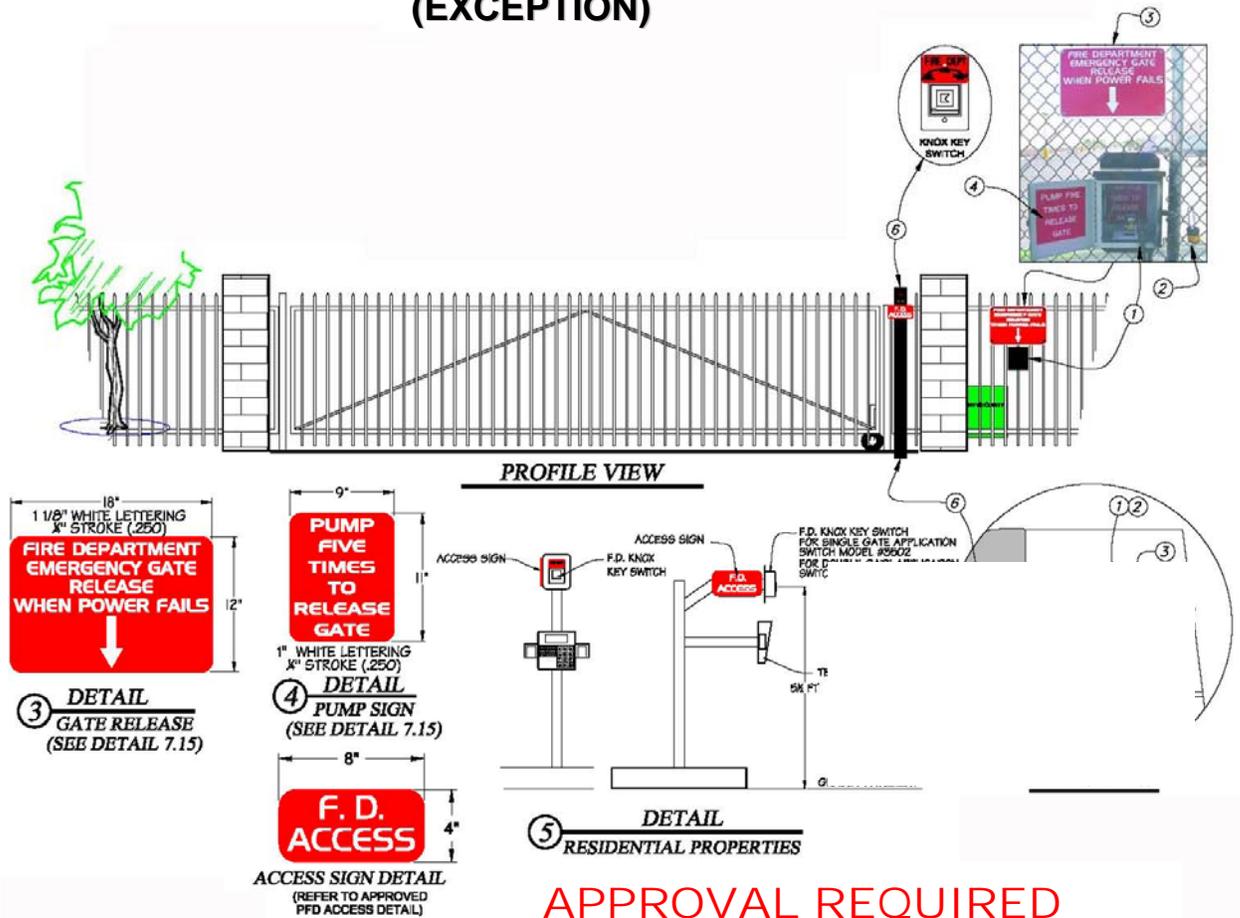
## RETRO FITTING EXISTING PROPERTY AUTO GATE & GUEST PULLOUT LANE PLUS PREEMPTION DETECTORS



### NOTES:

1. Provide an approved Knox Key Switch model #3502 on guest key pad pedestal at the entrance and Knox Key switch on preemption post on property side both installed five (5) feet above finished final grade.
2. The minimum overall width of the gate opening shall be 20 feet.  
**Notice:** larger openings are preferred, if possible.
3. Fire Department Knox Box order form for Knox Key Switch can be obtained at Fire Prevention, 14250 W. Statler Plaza, Suite101 or Community Development, 12425 W. Bell Road from 8:00 AM – 5:00 PM.

**AUTOMATIC GATE WITHOUT BATTERY BACKUP  
(EXCEPTION)**

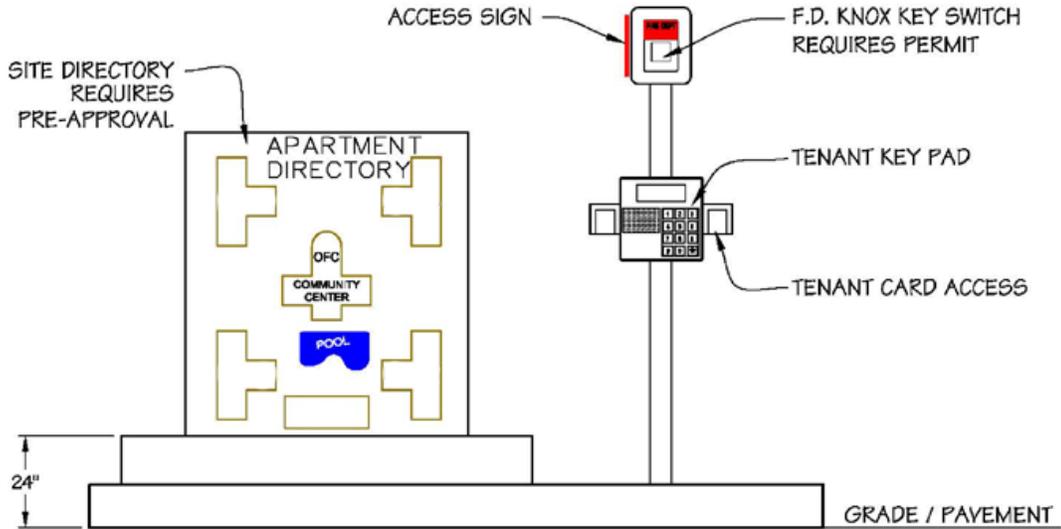


**APPROVAL REQUIRED**

**NOTES:**

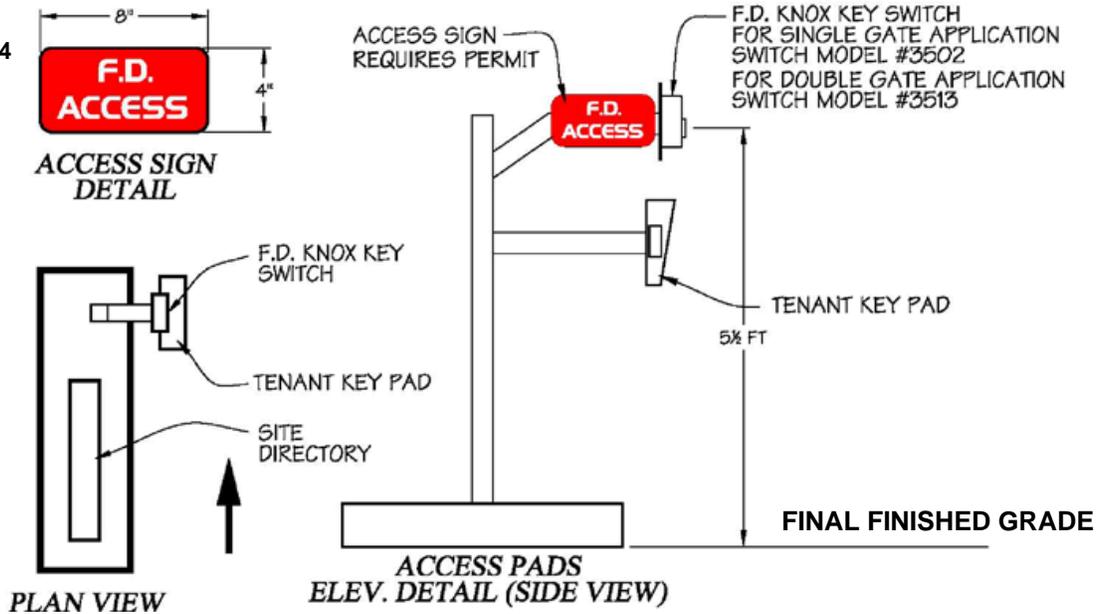
1. Gate release pump to be accessible from both sides of gate, three (3) feet from gate.
2. Lock cabinet doors with Knox padlock, one for each door.
3. Locate emergency gate release sign above pump box, on both sides of gate.
4. Locate pump sign on inside of pump box doors.
5. For residential properties – key switch shall be located on a pedestal above tenant key pad.
6. For commercial properties – key switch shall be recessed in 4"x4" square post adjacent to gate (on both sides).
7. Key switches and Fire Department Knox padlock order forms can be obtained at Fire Prevention, 14250 W. Statler Plaza, Suite101 or Community Development, 12425 W. Bell Road from 8:00 AM – 5:00 PM.
8. The minimum overall width of the gate opening shall be 20 feet.

## ENTRANCE ISLAND DETAILS TO RESIDENTIAL COMMUNITY WITH AUTOMATIC GATES



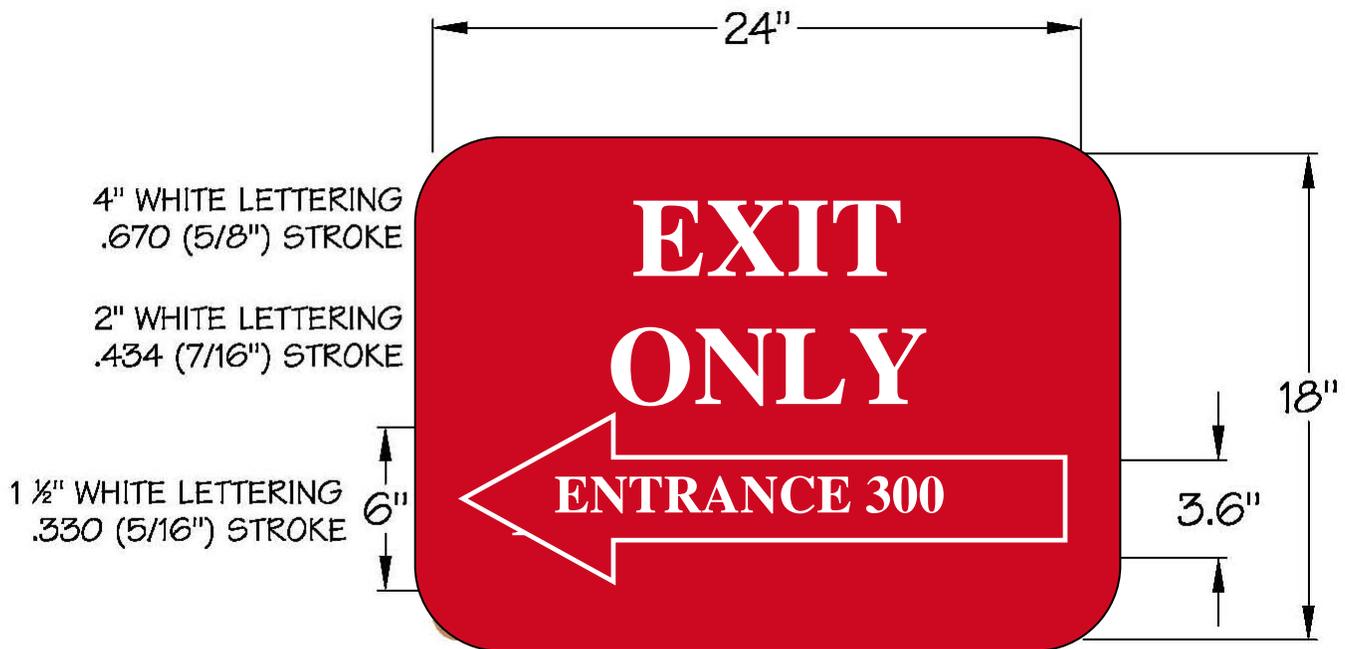
**ENTRANCE ISLAND  
ELEV. DETAIL (FRONT VIEW)**

REFER TO PAGE 2 - 4  
FOR DIMENSION  
SPECS.





**SPECIAL FIRE DEPARTMENT ACCESS SIGN**  
**SPECIAL APPLICATION**

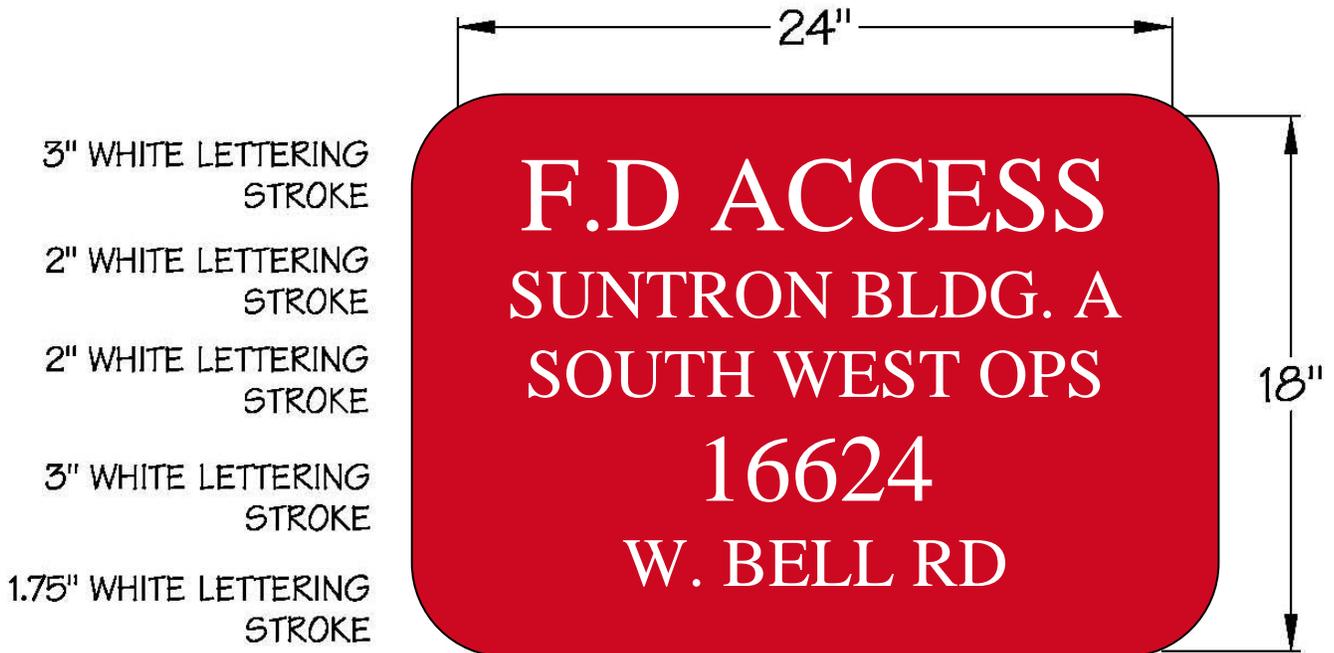


NOTES:

1. The sign plate shall be 24x18 inches with a thickness of .080 aluminum construction and 1½ inch radius corners.
2. Sign face shall have a white-reflective copy on red non reflective, engineer-grade vinyl background, using 3M Scotchlite sign face number R7-32 or equivalent, with 3M Scotchlite pressure sensitive reflective sheeting, engineer-grade or better, for lettering / numbering, using Handel Gothic font.
3. The sign shall identify the correct lane for Fire Department emergency access at restricted gate locations.



**SPECIAL FIRE DEPARTMENT ACCESS SIGN**  
**SPECIAL APPLICATION**

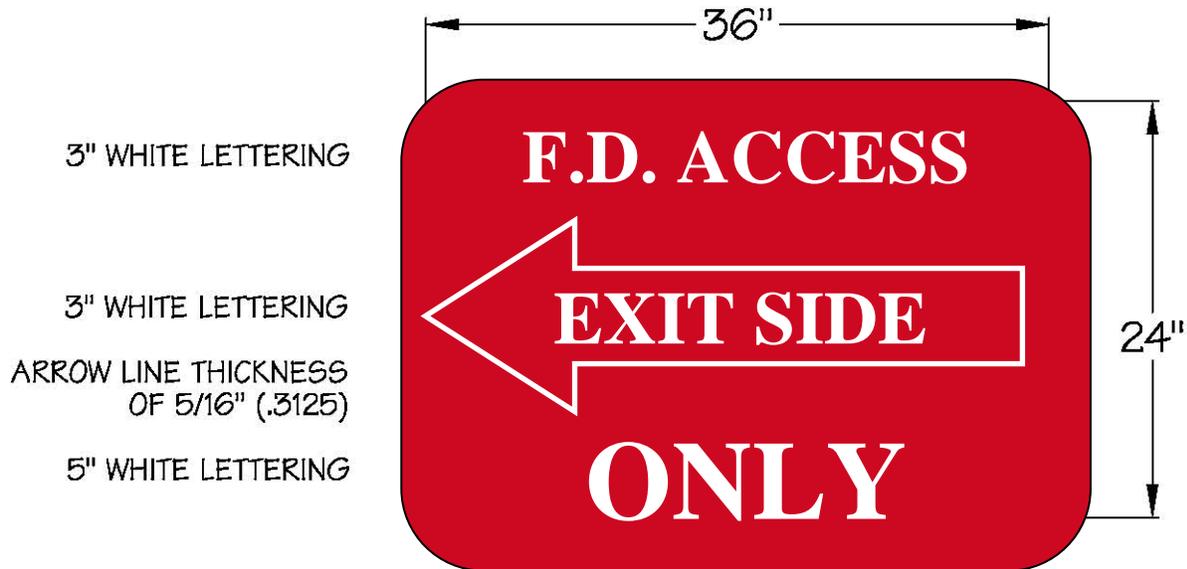


NOTES:

1. The sign plate shall be 24 x18 inches with a thickness of .080 aluminum construction and 1½ inch radius corners.
2. Sign face shall have a white-reflective copy on red contrasting non-reflective, engineer-grade vinyl background, using 3M Scotchlite sign face number R7-32 or equivalent, with 3M Scotchlite pressure sensitive reflective sheeting, engineer-grade or better, for lettering / numbering, using Handel Gothic font.
3. The sign shall identify the name of the apartment or business complex and the location of the main access entrance.



**SPECIAL FIRE DEPARTMENT ACCESS SIGN**  
**SPECIAL APPLICATION**

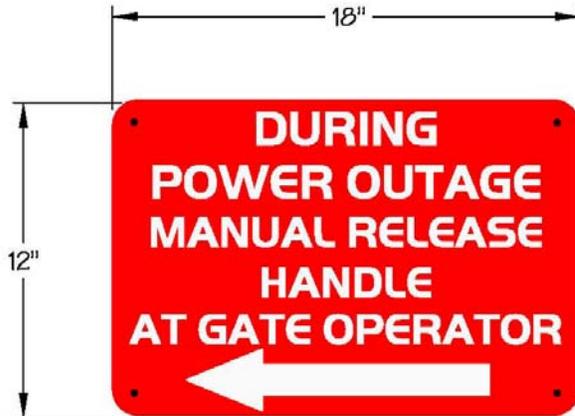


NOTES:

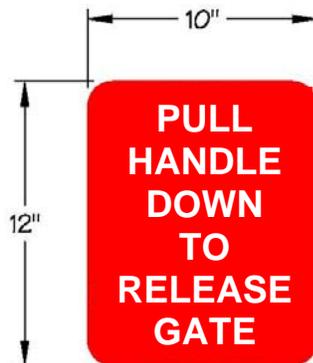
1. The sign plate shall be 36X24 inches with a thickness of .080 aluminum construction and 1½ inch radius corners.
2. Sign face shall have a white-reflective copy on red contrasting non-reflective, engineer-grade vinyl background, using 3M Scotchlite sign face number R7-32 or equivalent, with 3M Scotchlite pressure sensitive reflective sheeting, engineer-grade or better, for lettering / numbering.
3. The sign shall identify the correct lane for emergency Fire Department apparatus to access at restricted gate locations.



**FIRE DEPARTMENT ACCESS SIGN FOR MANUAL PUMP RELEASE  
(EXCEPTION)**



1.25" (1 ¼") LETTERING, ¼" STROKE  
 1.25" (1 ¼") LETTERING, ¼" STROKE  
 1.125" (1 1/8") LETTERING, ¼" STROKE  
 1.125" (1 1/8") LETTERING, ¼" STROKE  
 1.125" (1 1/8") LETTERING, ¼" STROKE



1.125" (1 1/8") WHITE LETTERING  
 ¼" STROKE (.250)

**NOTES:**

1. The sign plate shall be 18X12 or 10X12 inches with a thickness of .080 aluminum construction and 1½ inch radius corners.
2. Sign face shall have a white-reflective copy on red-reflective, engineer-grade vinyl background, using 3M Scotchlite sign face number R7-32 or equivalent, with 3M Scotchlite pressure sensitive reflective sheeting, engineer-grade or better, for lettering/numbering, using Handel Gothic font.





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## **APPROVED STROBESWITCH INFORMATION GATE ACCESS SYSTEM**

**STROBESWITCH** is a compact low cost detector, which recognizes a coded strobelight signal from special emitters mounted on fire vehicles and ambulances. The system provides an output activation of the emergency access switch. In the Surprise 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.

### **HOW IT WORKS**

The emergency vehicle uses a special strobe light to transmit a continuously flashing optical signal. **The TOMAR Model 2795-2 STROBESWITCH** 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.

### **AVAILABLE FROM:**

Any authorized gate company licensed by the Arizona Registrar of Contractors as L-5 or C-5 License. Refer to Yellow Pages under Gates & Operating Devices.