

## CHAPTER 13

### OTHER TYPES OF TRAFFIC SIGNALS

#### 13.1 Highway Traffic Signals

The primary type of traffic signal device in use is the traditional traffic control signal at an intersection (See Chapters 5-12 in this manual for details on traditional traffic control signals). However, a traffic signal can be a device other than a traditional traffic control signal. The following are additional types of traffic signals:

- **Pedestrian Hybrid Beacons (MUTCD Chapter 4F)**: A pedestrian hybrid beacon is a special type of hybrid beacon used to warn and control traffic at an unsignalized location, in order to assist pedestrians in crossing a street or highway at a marked crosswalk. Pedestrian hybrid beacons are also known as “HAWK Signals”.
- **Emergency Vehicle Traffic Control Signals (MUTCD Chapter 4G)**: A special traffic control signal that assigns the right-of-way to an authorized emergency vehicle.
- **Traffic Control Signal for One-Lane, Two-Way Facilities (MUTCD Chapter 4H)**: A traffic control signal for one-lane, two-way facilities, such as a narrow bridge, tunnel, or roadway section, and is a special signal that assigns the right-of-way for vehicles passing over a bridge or through a tunnel or roadway section that is not of sufficient width for two opposing vehicles to pass.
- **Ramp Control Signal (MUTCD Chapter 4I)**: A highway traffic signal installed to control the flow of traffic entering the freeway facility. This is often referred to as “ramp metering”.
- **Traffic Control for Movable Bridges (MUTCD Chapter 4J)**: A special type of highway traffic signal installed at movable bridges to notify road users to stop because of a road closure rather than alternately giving the right-of-way to conflicting traffic movements.
- **Traffic Signals at Toll Plazas (MUTCD, Chapter 4K)**: Traffic control signals used at toll booth plazas.
- **Flashing Beacons (MUTCD Chapter 4L)**: A highway traffic signal with one or more signal sections that operates in a flashing mode.
- **Lane-Use Control Signals (MUTCD Chapter 4M)**: A signal face displaying signal indications to permit or prohibit the use of specific lanes of a roadway or to indicate the impending prohibition of such use.
- **In-Roadway Lights (MUTCD Chapter 4N)**: In-roadway lights are special types of highway traffic signals installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop. This includes situations warning of marked school crosswalks, marked midblock crosswalks, marked crosswalks on uncontrolled approaches, marked

crosswalks in advance of roundabouts, and other roadway situations involving pedestrian crossings.

The next sections summarize important information on the other types of traffic signals listed above that are relevant in Tennessee.

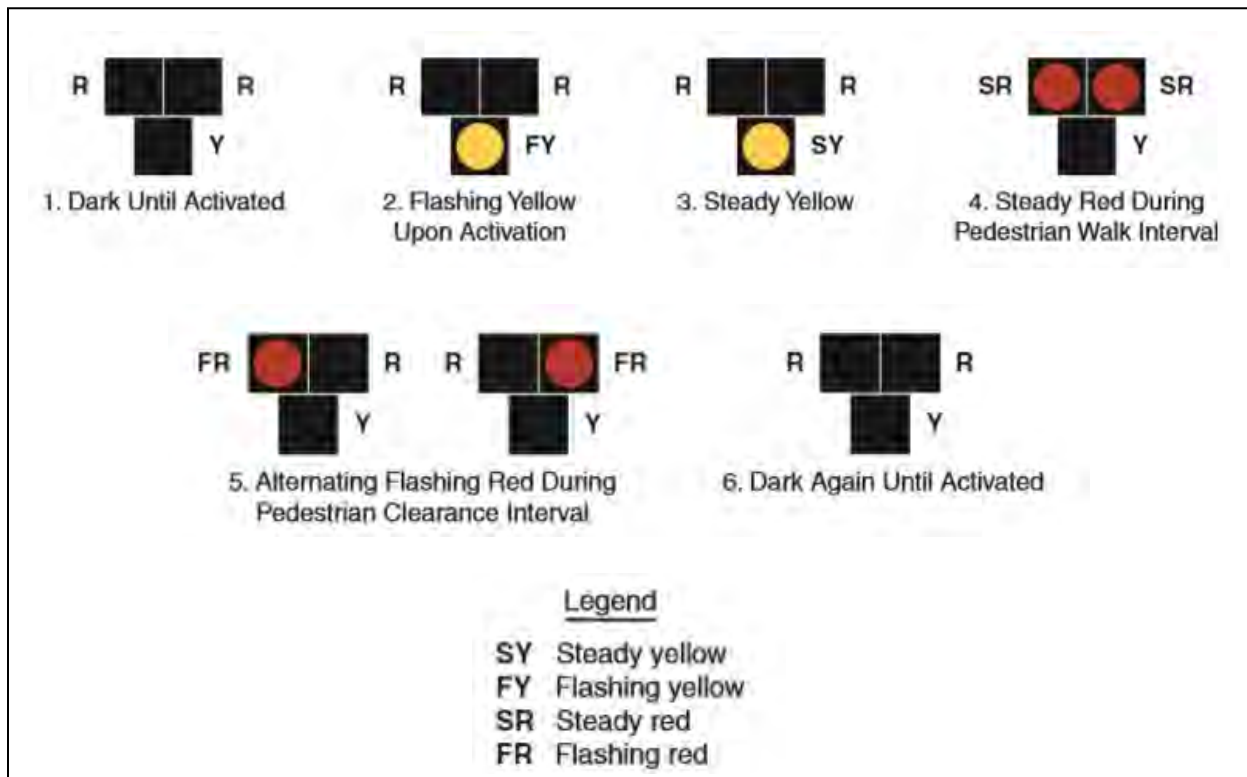
### 13.2 Pedestrian Hybrid Beacons

Generally, a pedestrian hybrid beacon is considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants. When an engineering study finds that installation of a pedestrian hybrid beacon is justified, then:

- At least two pedestrian hybrid beacon faces shall be installed for each approach of the major street;
- A stop line shall be installed for each approach to the crosswalk;
- A pedestrian signal head conforming to the provisions set forth in the MUTCD Chapter 4E shall be installed at each end of the marked crosswalk; and
- The pedestrian hybrid beacon shall be pedestrian actuated and shall conform to the provisions set forth in the MUTCD Chapter 4F.

Figure 13.1 presents a pedestrian hybrid beacon sequence display.

**Figure 13.1 – Pedestrian Hybrid Beacon Sequence Display**



### 13.3 Emergency Vehicle Traffic Control Signals

An emergency vehicle traffic control signal may be installed at a location that does not meet other traffic signal warrants, such as at an intersection or other location to permit direct access from a building housing the emergency vehicle (e.g. fire station).

#### 13.3.1 Displays

The emergency signal shall display either steady green or flashing yellow to the public street approaches when not activated. If the flashing yellow signal indication is used instead of the steady green signal indication, it shall be displayed in the normal position of the steady green signal indication; while the red and steady yellow signal indications shall be displayed in their normal positions. When an emergency vehicle actuation occurs, a steady yellow change interval followed by a steady red interval shall be displayed to traffic on the public street. An emergency vehicle hybrid beacon may be installed instead of an emergency traffic control signal under specific conditions (MUTCD Section 4G.04). Figure 13.2 presents an emergency hybrid beacon sequence display.

#### 13.3.2 Control

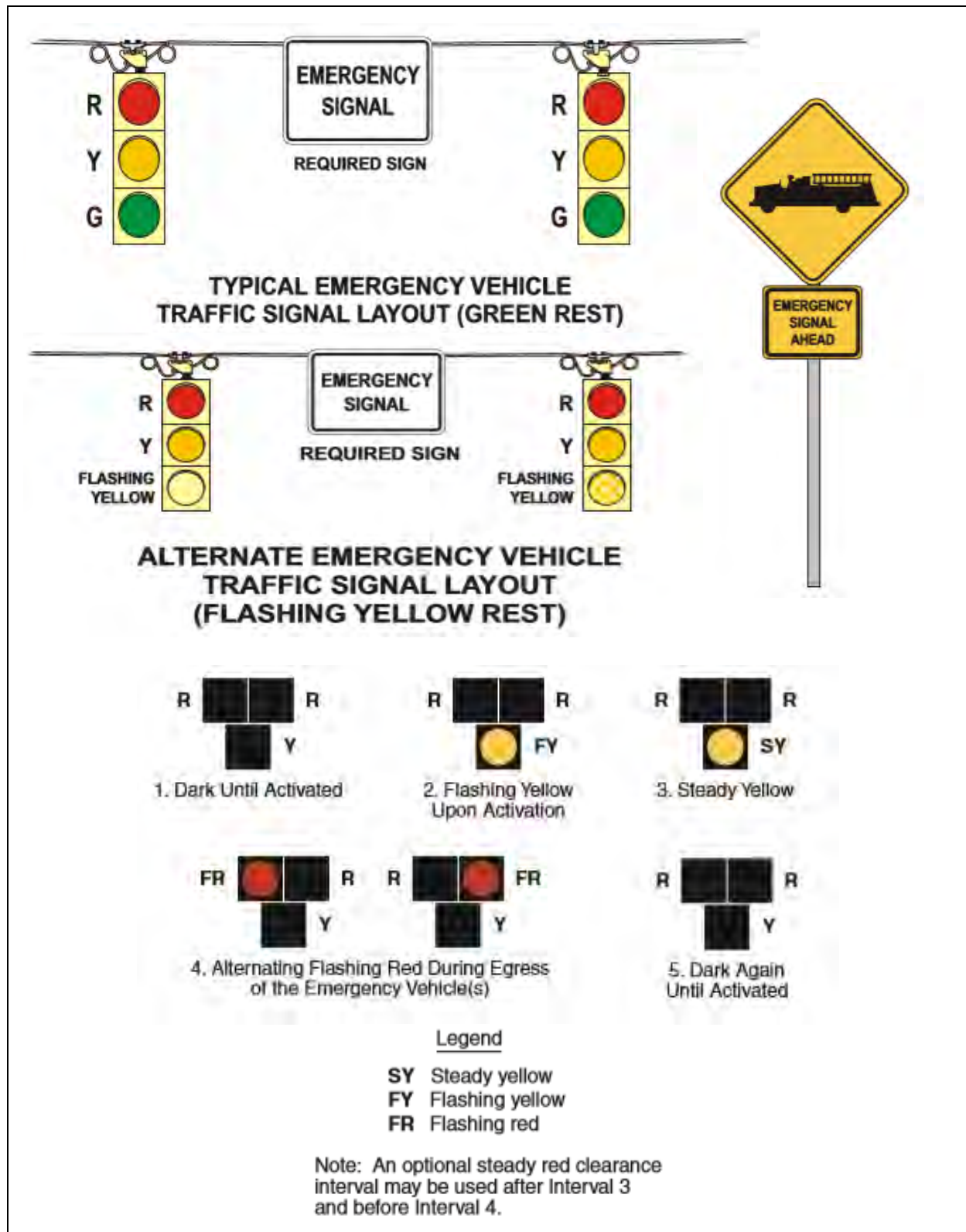
An emergency vehicle traffic control signal sequence may be initiated manually from a local control point, such as a fire station or police headquarters, or from an emergency vehicle equipped for remote operation of the signal.

#### 13.3.3 Signing

If an emergency signal is used, the following signs shall be installed:

- An Emergency Vehicle (W11-8) sign with an Emergency Signal Ahead (W11-12P) supplemental plaque shall be placed in advance of an emergency vehicle signal. A warning beacon may be installed to supplement the Emergency Vehicle sign; and
- An Emergency Signal (R10-13) sign shall be mounted adjacent to a signal face on each street approach.

Figure 13.2 – Emergency Vehicle Traffic Signals



## 13.4 Flashing Beacons

A flashing beacon is composed of one or more traffic signal sections operating in a flashing mode. A flashing beacon can provide traffic control when used as an intersection control beacon, or it can provide warning, as described below. An automatic dimming feature may be used to reduce the nighttime brightness.

### 13.4.1 Intersection Control Beacons

Intersection control beacons consist of two signal faces per intersection approach, each with one signal section having a 12-inch lens (See Figure 13.3). Normally, flashing yellow signal indications will be displayed to the major street and flashing red signal indications to the minor street. At the intersection of two streets of equal importance, flashing red signal indications may be displayed to both streets. A Stop sign shall be used on approaches to which a flashing red signal indication on an intersection control beacon is shown. If two horizontally aligned red signal indications are used on an approach for an intersection control beacon, they shall be flashed simultaneously to avoid being confused with grade crossing flashing-light signals. If two vertically aligned red signal indications are used on an approach for an intersection control beacon, they shall be flashed alternately. Intersection control beacons are intended to be used as a supplement to and not a replacement for other traffic control devices at the intersection. An intersection beacon may be installed when conditions do not justify the installation of a conventional traffic signal, but crash rates indicate the possibility of a special need. The most common application for these beacons is at intersections with minor approach stop control, where some approaching vehicles on the controlled legs have failed to stop.

### 13.4.2 Stop Beacons (Red)

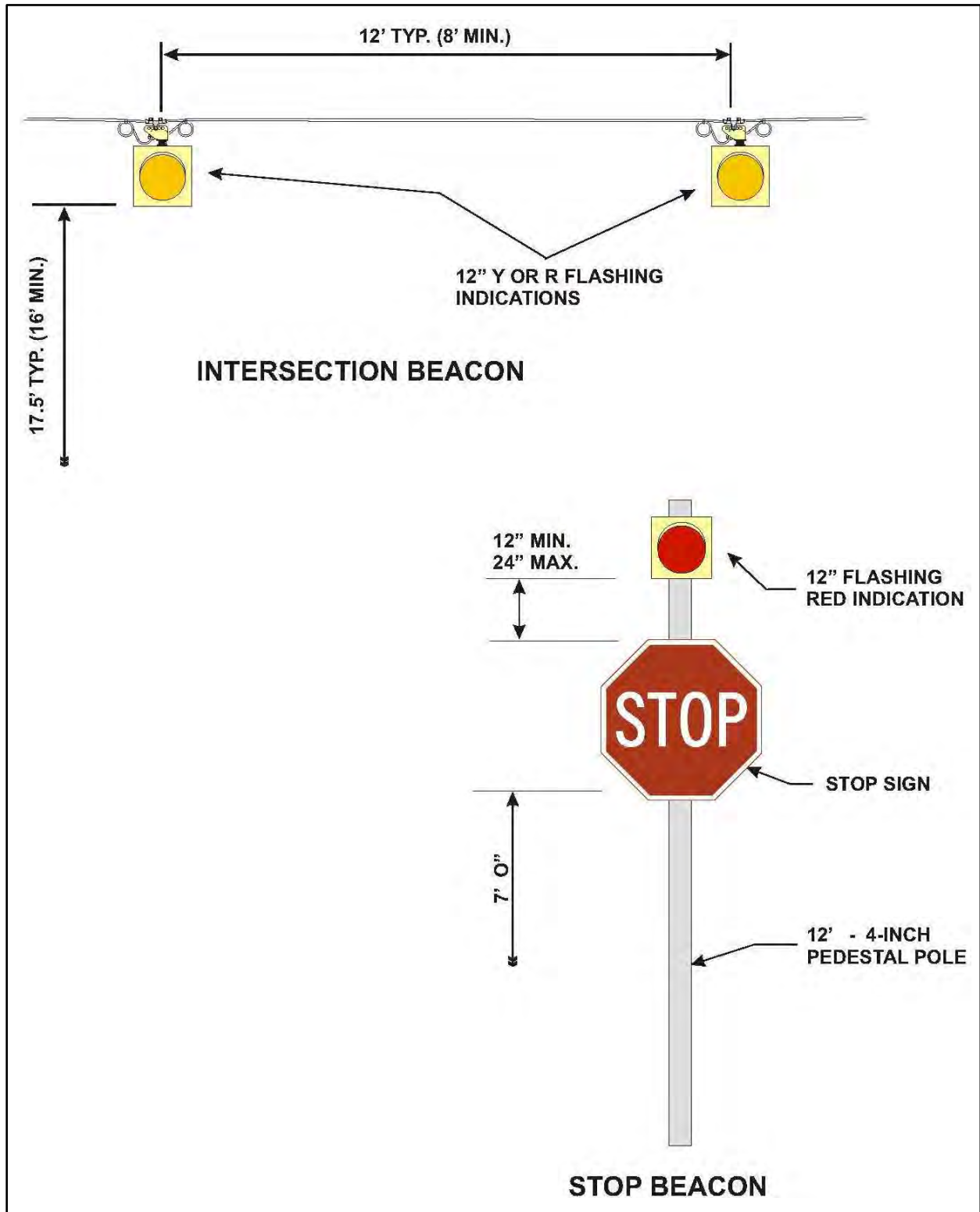
A stop beacon shall be used only to supplement a Stop sign, a Do Not Enter sign, or a Wrong Way sign. Stop sign beacons consist of one or more signal sections having flashing red 12-inch signal indications mounted on a Stop sign (See Figure 13.3). If two flashers are used on one sign, they shall flash simultaneously if mounted horizontally and alternately if mounted vertically. Stop beacons can be justified for Stop signs subject to the following considerations:

- **Violations:** A significant number of vehicles violate the stop condition.
- **Crashes:** A crash rate exists that indicates the presence of a special need.

### 13.4.3 Speed Limit Sign Beacons

A speed limit sign beacon consists of one or more signal sections with a flashing circular yellow signal indication in each section. It is used to supplement a Speed Limit sign. It may be installed with a fixed or variable Speed Limit sign (R2-1) where studies show a need to emphasize that a speed limit is in effect. Signal indications may be either 8-inch or 12-inch and they shall flash alternately.

Figure 13.3 – Intersection Control Beacons and Stop Beacons (Red)



#### 13.4.4 School Zone Speed Limit Sign Beacons

A school zone flashing beacon consists of two signal sections with a flashing circular yellow signal indication in each section and is used in conjunction with the standard School Zone sign (S5-1) (See TDOT *Standard Drawing T-SG-13*). Figure 13.4 displays the typical layout. Eight-inch lenses may be used and installed within the borders of the sign. When 12-inch signal heads are used, they must be mounted on the outside of the sign. The two indications in a school zone speed limit beacon shall flash alternately. A school zone beacon may be installed and maintained by a school board or local government at an established school zone under a Traffic Control Device Permit. School zone beacons on State highways must be coordinated through the TDOT Regional Traffic Engineer.

#### 13.4.5 Warning Beacons (Yellow)

Warning beacons are used only to supplement an appropriate warning or regulatory sign or marker (See Figure 13.5). Warning beacons consist of one or more signal sections, each having flashing yellow signal indications which flash alternately. Warning beacons may be justified by either of the following:

- **Obstruction Identification:** Warning beacons may be used to help identify obstructions in or immediately adjacent to the roadway where crash experience indicates that additional emphasis is needed to supplement existing signing and pavement markings. Such obstructions could include guardrail at T-intersections, bridge supports in or near the roadway, etc.
- **Supplement to Advance Warning Signs:** A flashing beacon may be used to supplement advance warning signs for a variety of conditions, where crash experience or field observation reveals that the warning signs alone are not effective. Such conditions could include sharp curves, obscured stop conditions, weather-related hazards such as fog and ice, obscured railroad crossings, truck crossings, plant entrances, etc. Warning beacons are also applicable to emphasize midblock crosswalks.

#### 13.4.6 Traffic Signal Ahead Beacons

Traffic signal ahead beacons consist of one or more signal sections, each having alternately flashing yellow signal indications (See Figure 13.5). They are used in conjunction with the standard Signal Ahead warning sign (W3-3). Signal ahead beacons may be justified under either of the following conditions:

- **First Signal:** On highways with a posted speed limit 45 mph or greater that is approaching the first signalized intersection of a community or town, and the intersection experiences a crash rate that indicates the presence of a special need.
- **Sight Distance:** On highways with a posted speed limit 45 mph or greater that is approaching a traffic signal whose signal visibility is less than that called for in Table 9.2 (Minimum Sight Distance for Signal Visibility).

Figure 13.4 – School Zone Speed Limit Sign Beacons

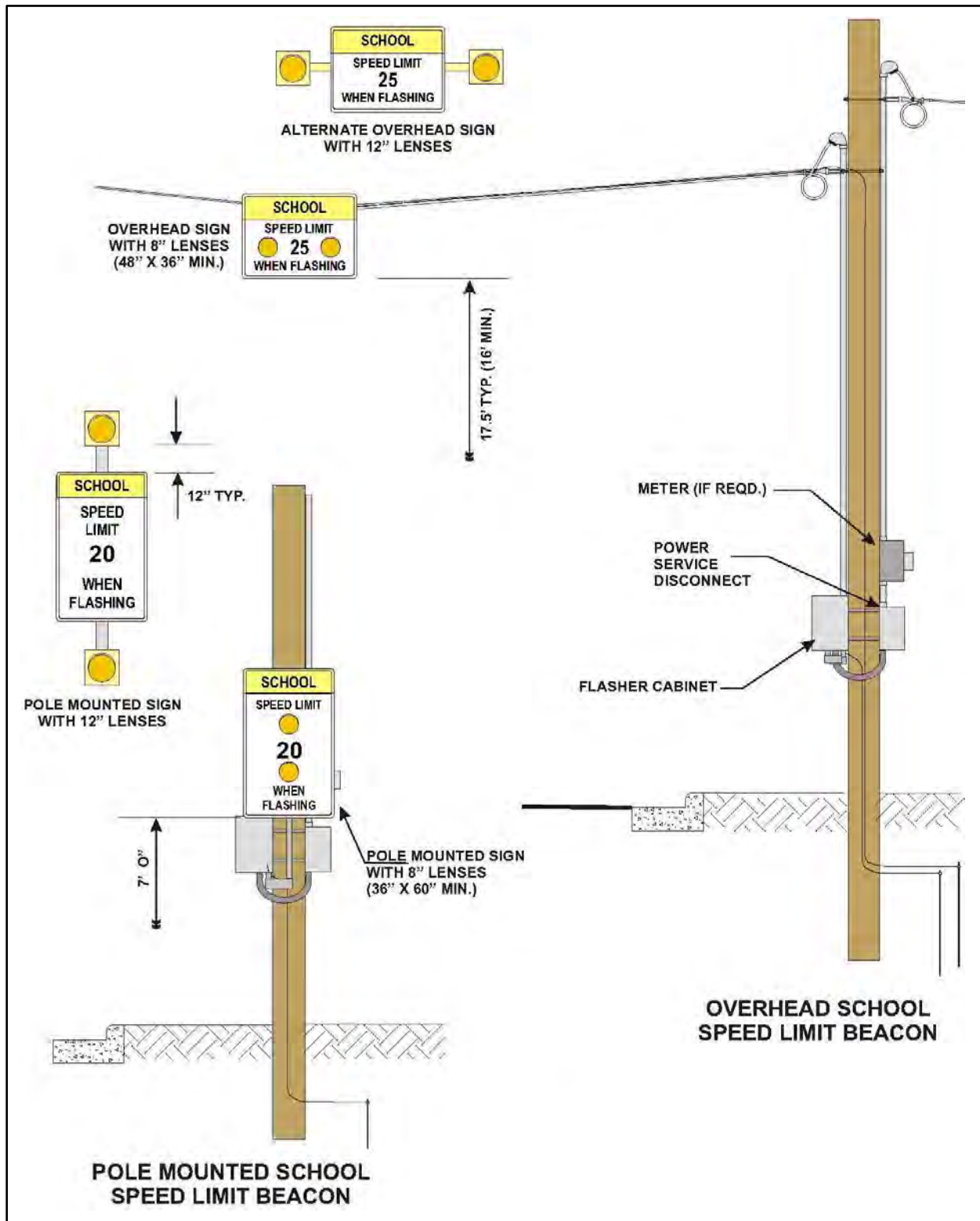
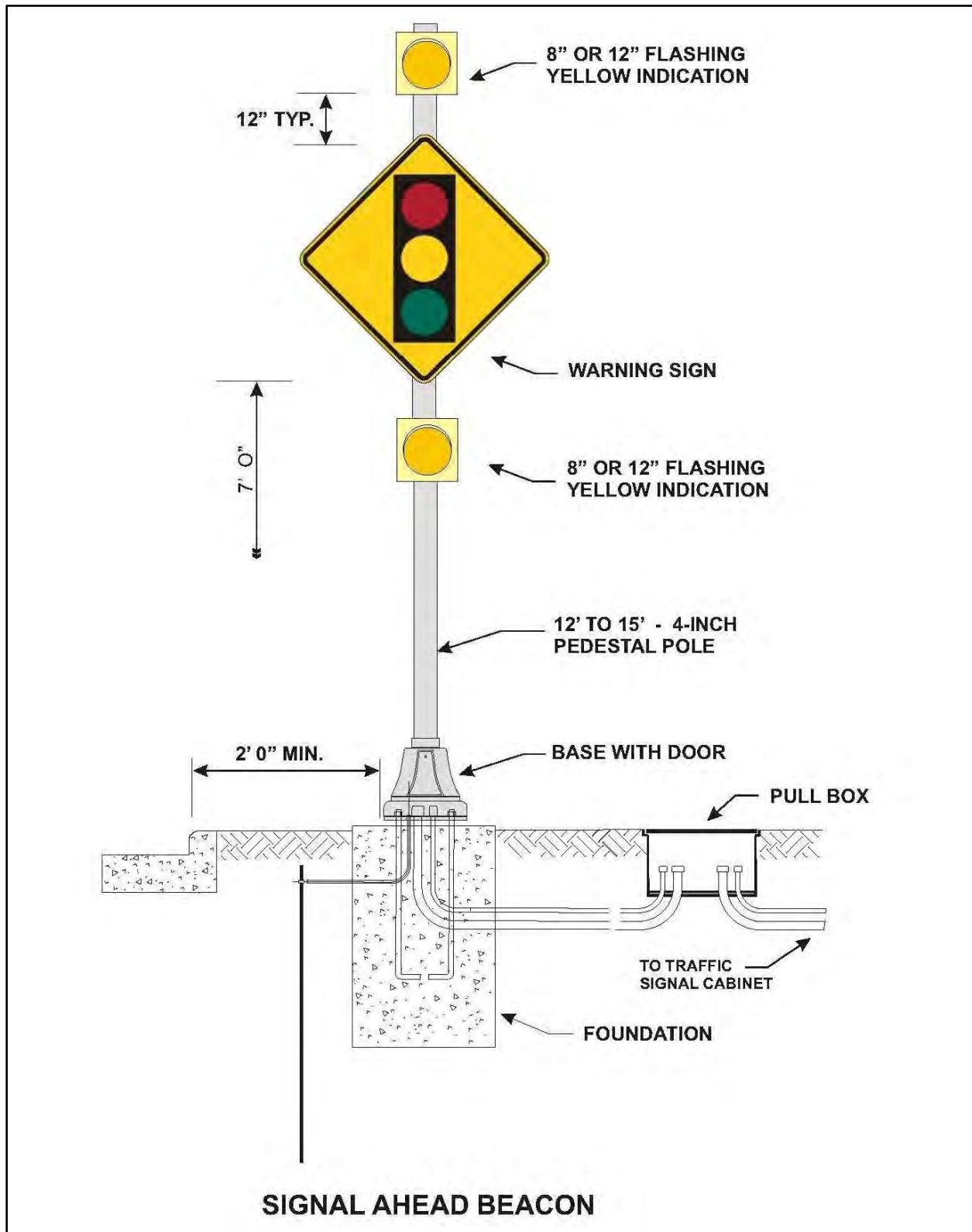




Figure 13.5 – Warning Beacons (Yellow) and Traffic Signal Ahead Beacons



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