

FLAGGING INSTRUCTION HANDBOOK



May 2007

This instruction handbook is for informational purposes only.

NOTE: *These instructions are for flaggers who are directing the traffic. For the purposes of this manual the term “**traffic**” should be used interchangeably with: vehicles, pedestrians, bicyclists and other users of the roads.*



**California Department
of Transportation
Division of Construction**

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FLAGGING INSTRUCTION HANDBOOK

FLAGGER CONTROL

Required Flagger Training and References

The Division of Occupational Safety and Health, Title 8, Chapter 4, Subchapter 4 (Construction Safety Orders), Article 11, Section 1599 requires that flaggers be trained in the proper fundamentals of flagging moving traffic before being assigned as flaggers. The training and instructions requirements for flaggers are included in the *California Manual on Uniform Traffic Control Devices* (CA MUTCD) Chapter 6.

Qualifications for Flaggers

Flaggers are responsible for public safety and for temporary traffic control. Because flaggers have frequent contact with traffic, they should demonstrate the following abilities:

- Receive and communicate specific instructions clearly, firmly, and courteously.
- Move and maneuver quickly in order to avoid danger from errant vehicles.
- Control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a temporary traffic control zone in frequently changing situations.
- Understand and apply safe traffic control practices, sometimes in stressful or emergency situations.
- Hear, see and recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

DEMONSTRATION OF PROPER METHODOLOGY AND OPERATIONS

Methodology

- The STOP/SLOW paddle is the primary and preferred hand signaling device because the STOP/SLOW paddle gives the public more positive guidance than red flags. Use of hand signaling with red flags is limited to emergency situations.
- A flagger must demonstrate the proper use of the STOP/SLOW paddle and hand signals before being assigned as a flagger.
- When a flagger is used only to slow traffic, use the SLOW side of the paddle, and the word STOP should be covered.
- The STOP/SLOW paddle must always be held by the flagger, never placed in a traffic cone or on a barricade and never used from inside a vehicle. Do not lean, sit, or lie on a vehicle.

Operations

Location and visibility are important factors in flagging operations.

- Place flagger stations at points of maximum visibility, preferably at the end of tangent sections.
- Flagger stations should be on the shoulder and opposite to the active work area.
- Ensure that flaggers are easily identified by traffic and not confused with other workers in the area.
- Stand alone next to the active work area. Do not allow other workers to congregate around the flagger station.
- Stay out of areas that are in shadows, do not blend with the background.
- Place personal items out of the way, so they will not distract approaching traffic or block your escape route.
- Cover completely, turn or remove C-9A (CA) flagger symbol and W3-4 (C36 CA) "BE PREPARED TO STOP" signs when flaggers are no longer needed.

HIGH VISIBILITY SAFETY APAREL

Flaggers must wear ANSI 107-99 Class 2 apparel with a background (outer) material color that is either fluorescent orange-red or fluorescent yellow-green, as defined in the standard. The retroreflective material must be either orange, yellow, white, silver, yellow-green or a fluorescent version of these colors and must be visible at a minimum distance of 1,000 feet. The retroreflective clothing, or the retroreflective material added to the clothing, must be designed to clearly identify the wearer as a person and must also have a minimum of one horizontal stripe around the torso. High visibility clothing must be kept clean and in good repair or otherwise replaced.

Flaggers must wear safety glasses, and a white hard hat.

For nighttime work, ANSI 107-99 Class 3 apparel should be considered. White outer garments with retroreflective material may be worn during hours of darkness in lieu of colored vests, jackets and shirts but never during snow or fog conditions.

When uniformed law enforcement officers are used, they should wear high-visibility clothing as described above.

FLAGGER STATIONS

Flagger stations must be located such that the traveling public has sufficient distance to stop at an intended stopping point before entering the work space. Flagger stations should be preceded by advance warning signs. Except in emergency situations, flagger stations must be illuminated during hours of darkness with a minimum 20-foot diameter illumination footprint (at 10-foot candles per CSO 1523) so the flagger is clearly visible to approaching traffic.

The flagger should stand either on the shoulder adjacent to the traffic being controlled or in the closed lane before stopping vehicle traffic. A flagger should only stand in the lane being used by moving traffic after traffic has stopped. The flagger should be clearly visible to all traffic at all times. The flagger should stand alone, never permitting a group of workers to congregate around the flagger station. Park all vehicles away from the flagger station.

At a spot construction, the flagger may have to take a position on the shoulder opposite the closed section in order to operate effectively.

Table for Stopping Distances (see page 13) may be used to determine the visibility distance for traffic approaching the flagger. At spot lane closures where adequate sight distance is available for the safe handling of traffic, the use of one flagger may be sufficient.

Distance of Flagger Station in Advance of the Work Space

Speed** (mph)	Distance (ft)	Distance*		
		-3% (ft)	-6% (ft)	-9% (ft)
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	596	638	686
65	645	682	728	785
70	730	771	825	891
75	820			

* Exhibit 3-2. *A policy on Geometric Design of Highways and Streets*, AASHTO, 2001. p. 115.

** Posted speed, off-peak 85th-percentile speed before the start of work, or the anticipated operating speed.

The distance shown may also be increased for other conditions that affect stopping distance.

FLAGGER PROCEDURES

The following methods of signaling with STOP/SLOW paddles must be used:



To Stop Traffic

To stop traffic, the flagger must face traffic and aim the STOP paddle face toward traffic in a stationary position with the arm extended horizontally away from the body. The free arm must be held with the palm of the hand above shoulder level toward approaching traffic.

To Let Traffic Proceed

To direct traffic to proceed after stopping, the flagger must face traffic with the SLOW paddle face aimed toward traffic in a stationary position with the arm extended horizontally away from the body. The flagger must motion with the free hand for traffic to proceed.



Flagger Procedures (continued)

To Alert and Slow Traffic



To alert or slow traffic, the flagger must face traffic with the SLOW paddle face aimed toward traffic in a stationary position with the arm extended horizontally away from the body. To further alert or slow traffic, the flagger holding the SLOW paddle face toward traffic may motion up and down with the free hand, palm down.

Flags Must Be Limited to an Emergency

The following methods of signaling with a flag must be used:

To stop traffic, the flagger must face traffic and extend the flag staff horizontally across the traffic lane in a stationary position so that the full area of the flag is visibly hanging below the staff. The free arm must be held with the palm of the hand above the shoulder level toward approaching traffic.

To direct stopped traffic to proceed, the flagger must stand parallel to the traffic movement and with the flag and arm lowered from the view of the traffic, and should motion with the free hand for traffic to proceed. Flags **must not** be used to signal traffic to proceed.

To alert or slow traffic, the flagger must face traffic and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flagger should keep the free hand down.

HAND SIGNALING DEVICES AND FLAGGING EQUIPMENT

Hand-signaling devices, such as STOP/SLOW paddles, lights, and red flags, are used to control the vehicles through temporary traffic control zones, and must be visible to the first approaching vehicle at all times. The flagger should also be visible to other traffic. The flagger should be stationed sufficiently in advance of the workers to warn them (for example, with audible warning devices such as horns, whistles, etc.) of approaching danger by out-of-control vehicles.

The STOP/SLOW paddle must have an octagonal shape on a rigid handle. STOP/SLOW paddles must be at least 18 inches wide with letters at least 6 inches high and should be fabricated from light semi-rigid material. The background of the STOP face must be red with white letters and border. The background of the SLOW face must be orange with black letters and border. When used at night, the STOP/SLOW paddle must be retroreflectorized.

The STOP/SLOW paddle may be modified to improve visibility by incorporating white flashing lights. Two lights may be installed and centered vertically above and below the STOP legend, or centered horizontally on either side of the STOP legend. Instead of the above two light arrangements, one light may be centered below the STOP legend.

The STOP/SLOW paddle may be used with either a 12-inch short handle or 66-inch long handle. The 24 x 24-inch size of the STOP/SLOW paddle may be used where greater emphasis is needed and speeds are 30 mph or more.

Flags must be a minimum 24-inch square, made of a good grade red material, and securely fastened to a staff that is approximately 36 inches in length. The free edge of a flag should be weighted so the flag will hang vertically, even in heavy winds. Flags must be retroreflectorized when used at nighttime. Flags must only be used in emergency situations and only until a STOP/SLOW paddle is available.

Each advance warning sign in each direction of travel must be equipped with at least two flags for daytime closures. Each flag must be at least 16 inches square in size and must be orange or fluorescent red-orange in color. Flashing beacons must be placed at the locations indicated for lane closures during hours of darkness.

Additional flagger equipment: advance warning signs; channelizing devices, such as cones; a method of communication, such as 2-way radios and other auditory warning devices as needed; drinking water; and protective clothing, in case of a change in weather. However, keep the flagger station clean and organized, eliminating distractions like chairs, books, or personal radios.

METHOD OF ONE-LANE, TWO-WAY TRAFFIC CONTROL

One-way traffic control can be handled by a single flagger at each end of the work zone. A pilot or official car is used with flaggers for lengthy work zones.

Single Flagger

- When a single flagger is used, the flagger should be stationed on the shoulder opposite the construction zone, or in a position where good visibility and traffic control can be maintained at all times.
- When a one-lane, two-way temporary traffic control zone is short enough to allow a flagger to see from one end of the zone to the other.
- When traffic is normally light to avoid the possibility of opposing traffic arriving at the traffic control zone at the same time.

Two Flaggers

- One of the flaggers should be designated as the lead flagger.
- Flaggers should be able to communicate with each other orally, electronically, or with manual signals that cannot be mistaken for flagging signals.


Pilot Car

- All traffic waits for the pilot car.
- Guides a line of vehicles through the temporary traffic control zone or detour.
- Two or more pilot cars may be used to guide two-way traffic through a particularly complex detour.
- Contractor or contracting authority's name should be prominently displayed.
- The PILOT CAR FOLLOW ME (G20-4) sign must be prominently mounted on the rear of the vehicle.

Official Car

- Always follows the last public vehicle proceeding through the section.
- May also be used to guide hauling trucks out of the closure and into live traffic.

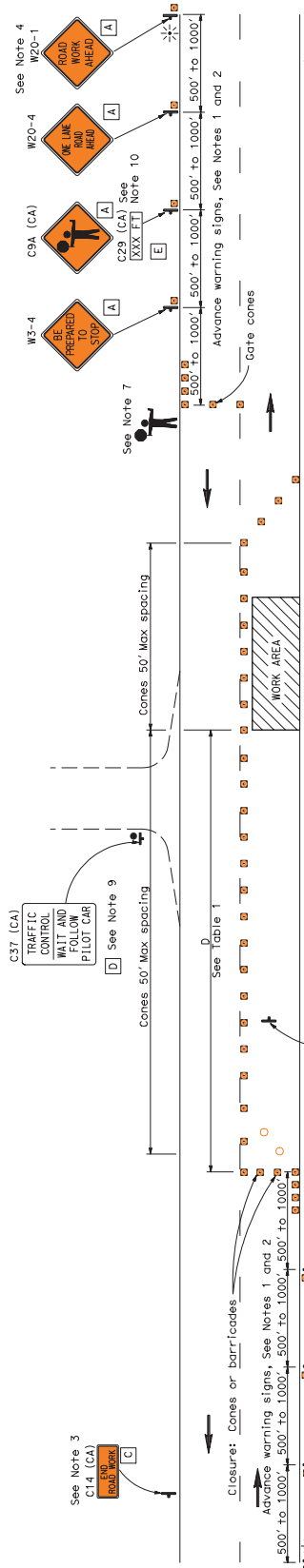
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS



Greg M. Edwards
 REGISTERED CIVIL ENGINEER
 MAY 1, 2006
 PLANS APPROVAL DATE
 The State of California or the office of the engineer or architect shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.
 To get to the Caltrans web site, go to <http://www.dfs.gov>

NOTES:
 Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on orange background. California code are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL





SIGN PANEL SIZE (MINIMUM)

A 48" x 48" - Speed of 45 mph or more
 B 36" x 36" - Speed less than 45 mph
 C 30" x 30"
 D 36" x 18"
 E 36" x 42"
 F 36" x 9"

- LEGEND**
- Traffic Cone
 - Traffic Cone (optional taper)
 - Temporary Sign
 - Direction of Travel
 - Portable Flashing Beacon
 - Flagger

NOTES:

1. Where approach speeds are low, advance warning signs may be placed at 300 spacing, and closer in urban areas.
2. Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A C14 (CA) "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project's limits.
4. If the W20-1 sign would follow within 2000' of a stationary W20-1 or C11 "ROAD WORK NEXT MILES" sign, use a W20-4 sign for the first advance warning sign.
5. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
6. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
7. Additional advance flaggers may be required. Flagger cones shall be placed, spaced, and visible to approaching traffic. After the first vehicle approaches the flagging station and flagger shall be illuminated and clearly visible to approaching traffic. The illumination footprint of the lighting on the ground shall be at least 20' in diameter. Place a minimum of four cones at 50' intervals in advance of flagger station as shown.
8. Place C30 (CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.
9. When a pilot car is used, place a C37 (CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign at all intersections within traffic control area. Signs shall be clean and visible at all times.
10. An optional C29 (CA) sign may be placed below the C9A (CA) sign.
11. Traffic cones or barricades may be placed on the optional taper as shown, barricades shall be Type I, II, or III.

TABLE 1

Approach Speed	Minimum D	Downgrade	
		Minimum D	%
25 and below	ft	158	-6%
	mph	158	-6%
30	ft	205	-3%
	mph	205	-3%
35	ft	257	-3%
	mph	257	-3%
40	ft	315	-3%
	mph	315	-3%
45	ft	378	-3%
	mph	378	-3%
50	ft	446	-3%
	mph	446	-3%
55	ft	520	-3%
	mph	520	-3%
60	ft	598	-3%
	mph	598	-3%
65	ft	682	-3%
	mph	682	-3%

* Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS

NO SCALE

T13

URGENT SITUATIONS

Flaggers must know how to handle emergency flagging operations, traffic control violations, accidents in traffic control zones, and hostile individuals.

Dealing with Emergency Vehicles

- When informed in advance of an approaching emergency vehicle, the flagger should clear an unimpeded path for the emergency vehicle by stopping traffic from all directions.
- When no advance notice is given, first stop the emergency vehicle, stop all traffic including construction equipment to provide a clear path for the emergency vehicle to pass.
- When the type of work, such as blasting or excavation makes the roadway impassable, advance arrangements should be made with the local police agency that has jurisdiction over the roadway.

Traffic Control Violations

- Warn construction workers, either visually or with an audible warning device, when a driver has run the flagger station.
- Stop all vehicles entering the work area, but do not put yourself in an unsafe situation.
- Be prepared for these possibilities.
- Plan your escape route in an emergency.

Traffic Accidents

- Notify your supervisor and call for help.
- If accidents happen in the line of waiting traffic, stay at your station and continue to control traffic until you receive instructions from your supervisor or a police officer.
- If an accident happens within the controlled area, hold approaching traffic and follow instructions from your supervisor, the head flagger or from a police officer.
- Flaggers must communicate with each other before releasing or stopping traffic.

Dealing with Hostile Individuals

- Be courteous and professional.
- Do not argue with motorists or pedestrians.
- If a motorist fails to follow your instructions and threatens the safety of the work area, note the vehicle license number, description of vehicle, and driver.
- Report the information to your supervisor for the purpose of filing a police report.

STOPPING DISTANCES

Road conditions affect stopping distance

Stopping distances vary according to road and weather conditions. On an icy road, for example, a vehicle may travel four times the distance it would require to stop on dry pavement.

The following chart compares stopping distances for a variety of road conditions.

