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## SECTION 12 – CONSTRUCTION AREA TRAFFIC CONTROL

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### **12-1 GENERAL**

Construction area traffic controls and devices shall conform to the requirements in the following Sections of these Specifications: Section 6-11, “General Safety Requirements”; Section 6-12, “Public Convenience and Safety”; Section 6-13, “Public Safety and Traffic Control”; Section 6-14, “Traffic Control Plans (TCP)”; Section 7-8, “Peak Hours, Hours of Darkness, Holidays, and Weekends”; and this Section (Section 12). Attention is directed to the CAMUTCD. All traffic controls and devices shall be as specified in the CAMUTCD unless otherwise indicated herein or in the Contract. At no time shall the requirements of these Specifications be construed as to reduce the minimum standards of the CAMUTCD.

All traffic control devices including, but not limited to, traffic cones or portable delineators, telescoping flag trees, arrow boards, barricades, and signs shall be placed before beginning work and shall be removed from the right-of-way at the end of each day or shift, or, for long-term closures, when no longer needed, and shall be placed so as to not obstruct bicycle lanes and pedestrian facilities. All traffic control devices left in the right-of-way by the Contractor are subject to removal by the City. The Contractor shall be required to pay any costs incurred by the City associated with the removal of these devices.

No equipment shall be parked within any traffic lanes, medians, or within the public right-of-way at any time of day or night, including holidays and weekends, without an approved lane or road closure. The Contractor shall notify the City a minimum of three (3) working days in advance of any lane closure and twenty (20) working days in advance of any road closure. Attention is directed to Sections 6 and 7 of these Specifications for additional information.

### **12-2 FLAGGING**

#### **12-2.01 Flaggers**

Flaggers shall perform their duties and shall be provided with the necessary equipment in accordance with the current “Instructions to Flaggers” published by Caltrans. The equipment shall be furnished and kept clean and in good repair by the Contractor at the Contractor's expense. All flaggers shall be trained as required by Cal/OSHA Regulations, and proof of such training shall be made available by the Contractor upon request by the City. Flaggers who cannot produce proof of training must be removed immediately if requested by the City.

Flaggers shall be used where necessary to control the flow of traffic through the construction site and shall be used in all cases where traffic is being routed through the construction zone under one-way control, or when ordered by the City.

#### **12-2.02 Flagging Costs**

Unless specified otherwise in the Special Provisions, the cost of furnishing all flaggers, including transporting flaggers to provide for passage of public traffic through the construction site in accordance with the provisions in Sections 6-12, “Public Convenience and Safety”, and 6-13, “Public Safety and Traffic Control”, of these Specifications shall be considered included in other items of work and no additional compensation will be made.

**12-3 TRAFFIC-HANDLING EQUIPMENT AND DEVICES**

**12-3.01 General**

In addition to the requirements in the CAMUTCD, all devices used by the Contractor in the performance of the Work shall conform to the requirements in this Section (Section 12).

Traffic-handling equipment and devices damaged from any cause during the progress of the Work shall be repaired or replaced by the Contractor immediately and at the Contractor's expense. If this is not done, the City reserves the right to replace damaged traffic devices and all costs will be borne by the Contractor.

**12-3.02 Changeable Message Signs (CMS)**

Portable Changeable Message Signs (CMS) are trailer mounted signs that can display one or more alternating messages. The City requires these signs to be placed along all arterial roads regardless of the speed limit, any city street with a posted speed limit of forty (40) MPH or higher, or as shown on the plans, as specified in these Specifications, and as directed by the City.

CMS shall be in place no less than seventy-two (72) hours prior to the start of a lane closure or five (5) business days in advance of a detour and remain in place for the duration of the work being performed. CMS shall be turned off when not in use and removed promptly upon completion of the Work.

**12-3.02.A Message Requirements:**

Message placed on the CMS shall consist of no more than two, three-line phrases. The use of acronyms in the message is prohibited, unless approved in writing by the City, and any abbreviations shall be commonly used by the typical motorist.

The typical message that will be displayed in advance of work requiring a lane closure or detour, shall include the following information (see examples 1-3):

- The condition or hazard to drivers
- Location of work
- Time of work (start date and applicable times/hours of work)
- The action that should be taken by the driver (optional)

<b>Example 1 – Lane Closure</b>	<b>Example 2 - Detour</b>	<b>Example 3 – Road Work</b>
Message 1: Lane Closed Elk Grove Boulevard Bruceville to Backer Ranch	Message 1: Road Closure Sheldon Road Waterman to Bradshaw	Message 1: Road Work Elk Grove Boulevard Bruceville to Backer Ranch
Message 2: Starting 1/1/2010 8:00 AM to 3:30 PM Expect delays	Message 2: Starting 1/1/2010 8:00 AM to 3:30 PM Use Alt Route	Message 2: Starting 1/1/2010 8:00 AM to 3:30 PM Expect delays

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The typical message that will be displayed while work is occurring, would include the following information (see examples 4 – 6 below):

- The condition or hazard to drivers
- Location of work
- Applicable times/hours of work
- The action that should be taken by the driver (optional)

<b>Example 4 Lane Closure</b>	<b>Example 5 Detour</b>	<b>Example 6 Road Work</b>
<p>Message 1:</p> <p>Lane Closed Ahead Elk Grove Boulevard Bruceville to Backer Ranch</p> <p>Message 2:</p> <p>8:00 AM to 3:30 PM Expect delays</p>	<p>Message 1:</p> <p>Road Closed Ahead Sheldon Road Waterman to Bradshaw</p> <p>Message 2:</p> <p>8:00 AM to 3:30 PM Detour Power Inn Road</p>	<p>Message 1:</p> <p>Road Work Ahead Elk Grove Boulevard Bruceville to Backer Ranch</p> <p>Message 2:</p> <p>8:00 AM to 3:30 PM Expect delays</p>

**12-3.02.B Placement:**

CMS shall be placed in accordance with the CAMUTCD and its location shall be clearly labeled on the traffic control plan that is submitted to the City for review.

In addition, the signs shall be placed in a manner so as they are not blocking any part of the traveled way, including the bicycle lane or sidewalk. In most cases, the sign may be placed in the landscape easement, parallel to the road. Any damage to existing improvements shall be repaired at the Contractor’s sole expense.

**12-3.02.C Tamper Proof:**

CMS that are placed in the City right of way, shall be locked and password protected so they cannot be moved or have their messages adjusted or modified by third parties.

**12-3.03 Cones**

Traffic cones shall be of good commercial quality, flexible material suitable for the purpose intended. Reflective bands shall be used with cones when lane or road closures are conducted at night. The outer section of the portion above the base of the cone shall be a

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highly pigmented fluorescent orange polyvinyl compound. The overall height of the cone shall be at least twenty-eight inches (28"). The base shall be of sufficient weight and size or shall be anchored in a manner such that the traffic cone will remain in an upright position. All cones shall be clean and free of oils, dirt, etc.

If the traffic cones are damaged, displaced, or are not in an upright position, they shall immediately be replaced or restored to their original location and position by the Contractor.

The traffic cones shall be placed at intervals as shown in the CAMUTCD, or as directed by the City.

When no longer required for delineation, all portable cones shall be removed from the work site.

### **12-3.04 Portable Channelizers**

Portable channelizers shall be fabricated from materials having sufficient rigidity to remain upright when unattended but shall be flexible enough to collapse upon impact by a vehicle. The base shall be of such shape as to prevent roll after impact. The base shall be of sufficient mass or shall be anchored in a manner such that the channelizer shall remain in an upright position. Ballast, if used for the bases of portable channelizers, shall be sand or water. On long-term closures, channelizers shall be affixed to the pavement as required by the City.

If the portable channelizers are displaced or are not in an upright position, the channelizers shall immediately be replaced or restored to their original location and position by the Contractor.

The vertical portion of the portable channelizer shall be of a fluorescent orange or predominantly orange color. Reflective bands shall be affixed to all channelizers used for night operations. The posts shall be not less than three and one-half inches (3-1/2") in diameter. The minimum height shall be three feet (3') above the road surface. When no longer required for delineation, all portable channelizers shall be removed from the work site immediately.

### **12-3.05 Telescoping Flag Trees**

Telescoping flag trees shall be of good commercial quality material, clean and intelligible, suitable for the purpose intended, and capable of maintaining an upright position at all times while in use.

### **12-3.06 Portable Flashing Barricades**

Each flashing barricade unit shall consist of a lamp, a flasher unit, a standard, a battery power source, and a base. The units shall be assembled to form a complete, self-contained, flashing beacon that can be delivered to the Work and placed in immediate operation.

- The barricade standard shall be adjustable with provisions for securing the standard at the desired height.
- The lens for the beacon lighting unit shall be glass or plastic conforming to the provisions in ANSI Standard: D-10.1 for yellow traffic signal lens.

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- The lamp shall be rated at 25 W for operation on 12-V battery current.
- The flashing beacon assembly shall be weatherproof and shall be capable of operating a minimum of 150 hours between battery recharging or other routine maintenance.

Portable flashing barricades shall be checked periodically to insure functionality. Any flashing barricades found to be in a condition that would prevent them from functioning as required to provide adequate warning at night shall be promptly removed from service and replaced with an operational unit.

### **12-3.07 Barricades**

Barricades are designated by type according to function and physical characteristics. Type I, II and III barricades are portable construction barricades; Type IV barricades are intended for permanent installation. Type I, II, and III barricades shall conform to the provisions, details and dimensions as specified in the CAMUTCD. Type IV barricades shall conform to the Contract.

#### **12-3.07.A Materials**

Materials for Type I, II and III barricades shall conform to provisions of the CAMUTCD. Type IV barricades shall be constructed of materials as follows:

- Posts shall be four inches by four inches (4"x4"), nominal size, highway post grade redwood or No. 2 heart structural grade redwood (1000f).
- Rails shall be two inches by six inches (2"x6"), nominal size light framing construction grade Douglas fir, free of heart center.
- Object markers for mounting on each post between the rails shall be red reflectorized sheeting, tape, or plates, [three inches by five inches (3"x5") minimum size]. Where called for on the Plans, object markers shall be Type N markers (9-spot) conforming to the provisions of the CAMUTCD.
- Paint for posts and rails shall consist of a minimum of one coat of wood primer and two coats of white exterior latex enamel, conforming to the provisions of Section 50-36, "Paint", of these Specifications.

Barricade warning lights shall conform to the provisions as specified in the CAMUTCD. Unless otherwise specified in the Contract, Type A Barricade Warning Lights (flashers) shall be used.

The Contractor shall establish the necessary quality control to assure compliance with these Specifications. No Certificate of Compliance, as such, will be required for Type IV barricades. A Certificate of Compliance may be required for Type I, II and III barricades for warning lights to assure compliance with these Specifications.

#### **12-3.07.B Installation and Maintenance**

##### **12-3.07.B.(1)Construction Barricades**

Construction barricades of the type specified in the Special Provisions shall be furnished and set at locations as directed by the City. The barricades shall be maintained for as long

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as necessary and shall be checked for their position location at the close of each day's activity and more often as necessary.

The batteries of warning lights shall be maintained at a high rate of charge at all times.

### **12-3.07.B.(2)Permanent Barricades**

The posts of the barricade shall be placed in holes excavated to the required depth as shown on the Plans. The space around the posts shall be backfilled with selected earth free of deleterious material and compacted. Wood wedges may be used to plumb posts prior to backfilling. Wood posts of barricades shall not be embedded in concrete.

Rails shall be attached to posts with 16d-galvanized nails.

All exposed wood surfaces shall be given one application of wood primer and two (2) coats of white exterior enamel, conforming to the provisions of Section 50-36, "Paint", of these Specifications. After painting, the object markers shall be attached to each post as shown on the Plans.

### **12-3.08 Flashing Arrow Sign (FAS)**

The use of a Flashing Arrow Sign (FAS) is required on major streets for lane closures during hours of darkness and for all lane closures lasting more than two (2) hours, or as specified in the Contract or as directed by City. Major streets are those roadways with two or more marked traffic lanes in each direction. An exception may be allowed in situations where it is determined by the City that the amount of traffic does not warrant the use of a FAS.

FAS shall be finished with commercial quality flat black enamel and shall be equipped with yellow or amber lamps that form arrows. Each lamp shall be provided with a visor and the lamps shall be controlled by an electronic circuit. The control shall be capable of dimming the lamps by reducing the voltage to fifty percent plus or minus five percent (50% ± 5%) for nighttime use.

Each FAS shall be mounted on a truck or on a trailer and shall be capable of operating while the vehicle is moving and being placed and when the FAS is operating in place or being maintained. The trailer on which the FAS is mounted shall be equipped so that it can be leveled and plumbed.

Power to operate the sign shall be obtained from the vehicle on which the sign is mounted or from a generating plant mounted on the vehicle. The power supply shall be monitored by the Contractor and, if failure is observed, a replacement FAS shall be put in use immediately either by the Contractor or the City. If the City provides and places the replacement FAS, the Contractor is responsible for reimbursement of the City's costs.

### **12-3.09 Construction Area Signs**

#### **12-3.09.A General Requirements**

The Contractor is responsible for informing the public of traffic conditions existing within the construction area at all times by placing warning and advisory signs. The term "Construction Area Signs" shall include all temporary signs required for the direction of public traffic through or around the Work during construction. These signs are shown in or

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referred to in the current CAMUTCD. All construction area signs shall be installed at the locations shown on the Plans, the Traffic Control Plan, and as directed by the City.

All construction area signs shall conform to the dimensions, color, and legend requirements of the Plans, the Traffic Control Plan, the current CAMUTCD, and these Specifications. All sign panels shall be the product of a commercial sign manufacturer and shall be as specified in these Specifications.

### **12-3.09.B Covering Signs**

The Contractor may be required to cover certain signs during the progress of the Work. Covers for construction area signs shall be of sufficient size and density to completely block out the message so that it is not visible either during the day or at night. Covers shall be fastened securely to prevent movement caused by wind.

### **12-3.09.C Cleaning Signs**

The Contractor shall clean all construction area sign panels at the time of installation and as often thereafter as the City determines to be necessary, but at least once every month.

### **12-3.09.D Used Signs**

Used signs will be considered satisfactory for use if approved by the City before placement.

### **12-3.09.E Replacement and Backup Signs**

To properly provide for changing traffic conditions and damage caused by public traffic or otherwise, the Contractor shall be prepared to furnish additional construction area sign panels, posts, and mounting hardware or portable sign mounts on short notice. The Contractor shall maintain an inventory of the commonly required items at the jobsite or shall make arrangements with a supplier who is able, on a daily basis, to furnish the items on short notice.

### **12-3.09.F Stopping or Parking Prohibition (Tow-Away Zone)**

The Contractor may install "Tow-Away" or "No Parking, No Stopping" signs in critical areas to provide traffic lanes or work areas. Prohibition of stopping or parking, or the installation of tow-away signs, requires written approval from the City. The Contractor shall notify the City five (5) working days in advance of the placement of the signs. After approval of the stopping or parking restrictions or tow-away signs, the Contractor shall furnish and place approved "NO STOPPING" or "NO PARKING" signs where directed. The messages on the signs must include the dates and times of the required prohibition. Article 22652 of the California State Vehicle Code requires a sign to be in place twenty-four (24) hours before it becomes legally enforceable.

### **12-3.09.G Protection, Maintenance, Removal, Storage, and Resetting of Signs**

The protection and maintenance of existing signs and the removal, protection, storage, and resetting of traffic signs that are affected by the Work is the responsibility of the Contractor, as directed by the City or as specified in the Special Provisions. The Contractor

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shall inventory all existing signs prior to the start of work. The City will confirm the inventory in writing prior to the start of work.

### **12-3.09.H Movement of Traffic Signs and Traffic Control Facilities**

Existing traffic signs and traffic control facilities within the limits of the Work shall not be moved except as necessary to prevent them from being damaged by construction operations or as directed in writing by the City. When a sign needs to be removed because it interferes with the Contractor's work, it shall be done only with the written permission of the City.

### **12-3.09.I "Road Construction Ahead (C-18)" and "End of Construction (C-13)" Signs**

All scheduled road construction within the right-of-way lasting longer than twenty-four (24) hours shall have permanent construction signs installed. C-18 "Road Construction Ahead" signs shall be installed at the approaches to the Work and C-13 "End of Construction" signs shall be installed at the egresses of the Work. Each sign shall be permanently placed on a four-inch by four-inch (4" x 4") post and shall remain in place until the Work has been completed, or until directed by the City in writing. Exact placement of the signs will be as shown on the Plans or the Traffic Control Plan, or as determined in the field by the City.

### **12-3.09.J Contractor Furnished Signs**

The size, wording, and location of all signs furnished and erected by the Contractor must be approved by the City prior to placement.

### **12-3.09.K Obscuring Visibility and Conflicting With Meaning**

Signs or other protective devices furnished and erected by the Contractor shall not obscure the visibility of, nor conflict in intent, meaning, and/or function with existing signs, lights, or traffic control devices, or any construction area signs, lights, and traffic control devices.

### **12-3.09.L Permanent Construction Signs**

Permanent construction signs shall be installed on wood posts in the same manner shown on the Plans for installation of roadside signs.

Post sizes and numbers of posts shall be as shown on the Plans, except that when stationary mounted signs are installed and the type of sign installation is not shown on the Plans, post size and the number of posts will be determined by the City. Posts shall be good, sound, wood posts, suitable for the purpose intended.

Sign panels for stationary signs shall consist of Type IIIA reflective sheeting applied to a sign substrate. Sign panels shall conform to the requirements specified for aluminum signs in the Caltrans "Specifications for Aluminum Signs". Copies of the Caltrans "Specifications for Reflective Sheeting Aluminum Signs and Framing Details for Sheet Aluminum Signs" may be obtained from the Caltrans Office of Business Management, Materiel Operations Branch, 1900 Royal Oaks Drive, Sacramento, CA 95815.

Sign panels shall also conform to the following:



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- Type IIIA reflective sheeting and aluminum substrates shall be as specified in the “Specifications for Reflective Sheeting Aluminum Signs”. Sign substrates fabricated from materials other than aluminum shall be as specified in the Special Provisions.
- Legend and border may be applied by a screening process or by use of pressure sensitive cut-out sheeting. Size and spacing of letters and symbols shall be as depicted on the sign specification sheets published by Caltrans. Copies of the sign specifications may be purchased from the Caltrans Publication Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815.
- All rectangular sheet aluminum signs over 1375 mm measured along the horizontal axis, and all diamond-shaped sheet aluminum signs 1500 mm and larger shall be framed unless otherwise specified. Frames shall be constructed in accordance with “Framing Details for Sheet Aluminum Signs”, Sheets 1 through 4 and Table 1 on Sheet 5, as published by Caltrans.
- Sign panel fastening hardware shall be commercial quality.

### **12-3.09.M Removal of Permanent Traffic Control Signs**

For existing permanent traffic control signs that are to be removed and not relocated, the Contractor shall remove all sign faces, hardware, and posts. The Contractor shall deliver the removed items to the City facility designated in the Special Provisions. The Contractor shall replace any sign faces, hardware, or posts damaged during removal and transport.

### **12-3.09.N Regulatory Sign Placement and Removal**

The temporary relocation of each "STOP" or other regulatory traffic sign shall be done immediately upon its removal, and to a location as close as possible to the original position of sign or as directed by the City.

Stop signs and other traffic control signs and facilities necessary for the control of traffic during the project shall be maintained in their original positions, as noted in the City's inventory, except for temporary repositioning necessitated by the Work. No signs may be moved from their original positions without prior written approval of the City. Temporary sign positions must be equivalent to the original positions. The standard sign position is seven to ten feet (7' to 10') from the edge of pavement. Stop signs should not be located more than thirty feet (30') from the painted roadway centerline, unless they are supplemental signs, more than forty feet (40') in advance of the limit line, or more than twenty feet (20') beyond the limit line. When the intersection approach width for one direction of traffic is thirty feet (30') or more, the City may require that stop signs be erected on both the left and right sides of that approach.

Temporary traffic control signs may be mounted on portable supports only during working hours when the Contractor's workers are available to maintain the signs in proper position at all times. The position and mounting devices for temporary signs shall be subject to the approval of the City.

Outside of working hours, and at all other times when the Contractor is not available to maintain signs on portable temporary supports, all temporary stop signs and other traffic control signs must be mounted on their original or equivalent posts. The posts must be set

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in the ground with compacted backfill to a depth of at least thirty-two inches (32”) in the same way that permanent signs are installed. The bottom of the sign face must be at least five feet (5’) but not more than seven feet (7’) above the edge of traveled way and must be seven feet (7’) above the edge of traveled way if subject to pedestrian traffic adjacent to the post. When temporary sign post holes must be dug in completed pavement surfaces, the City shall review the temporary position with respect to the proper final position.

### **12-3.09.0 Sign Posts**

When the Work will change traffic patterns, require relocation, removal, or installation of permanent regulatory traffic control and other signs, the Contractor shall relocate, remove, or install sign posts as shown on the Plans, or as directed by the City.

## **12-4 MEASUREMENT AND PAYMENT**

Except as otherwise provided in these Specifications or the Special Provisions, full compensation for conforming to the requirements in the following Sections of these Specifications—this Section (Section 12); Section 6-11, “General Safety Requirements”; Section 6-12, “Public Convenience and Safety”; Section 6-13, “Public Safety and Traffic Control”; Section 6-14, “Traffic Control Plans (TCP)”; and Section 7-8, “Peak Hours, Hours of Darkness, Holidays, and Weekends”—is included in the prices paid for the various items of work and no additional compensation will be paid.

When the Contract includes an item for Type I, II, III, and IV barricades, the payment will be made per barricade ordered by the City. After initial placement of Type I, II, and III barricades, and if ordered by the City, the barricades shall be moved from location to location and the moving costs will be paid for as extra work, as provided in Section 9, “Changes and Claims”, of these Specifications. The unit price paid for each Type I, II, and III barricade includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the furnishing, placing, maintaining, repairing, replacing and removing the barricades, as shown on the Plans, as specified in these Specifications and the Special Provisions, and as directed by the City.

Full compensation for repairing damage to detours caused by public traffic is included in the prices paid for the various items of work and no additional compensation will be paid.