

## **SECTION 84: TRAFFIC STRIPES & PAVEMENT MARKINGS**

### **84-1.01 DESCRIPTION**

Traffic stripes and pavement markings shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, the City Design Standards, The California Manual on Uniform Traffic Control Devices (CAMUTCD), The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

Sandblasting of traffic stripes shall not be permitted. Removal of traffic stripes shall be by grinding, or by other methods approved in writing by the Engineer. Drain inlets adjacent to areas to be ground shall be protected from grindings entering the storm drain system. For removal of pavement markings, a rectangular area shall be ground to prevent ghosting of the original marking and be covered with rectangular area of Type II slurry. Conflicting striping shall be removed completely. Type II slurry of conflicting striping is required when it crosses the new traveled lane. When this occurs, the entire lane shall be slurried from lane line to lane line over the entire length of the conflicting striping. This requirement will not apply to ceramic markers unless specified on the plans.

All striping or pavement markings damaged during construction shall be repaired/replaced at the contractor's expense. Repairs shall consist of complete replacement of markings or legends, replacement of sections of thermoplastic striping, and replacement of damaged or missing markers as directed by the Construction Inspector.

All pavement markings and 4 inch to 8 inch pavement stripes on concrete surfaces (unless otherwise noted) shall be 3M tape or equivalent in place of thermoplastic material and shall require 1 inch black borders when located on concrete pavement. The 1 inch black borders shall be in addition to required width of the stripe.

### **84-1.03 TOLERANCES & APPEARANCES**

The following clarifications or modifications shall be applied when installing traffic stripes and pavement markings:

1. In addition to locations as shown on the plans, bike lane signs and pavement markings shall be installed at no more than 1/2 mile intervals and following every break in the bike lane striping. The BIKE LANE legend shall be centered in the lane to ensure the legend does not run into the lane striping.
2. A bicycle detector pavement marking shall be installed in conjunction with each bicycle detector loop at signalized intersections per CAMUTCD Figure 9C-7 and shall be placed starting 6 inches back of the crosswalk/stop bar.
3. Unless otherwise specified on the plans, crosswalks shall be 11 feet wide, measured from the centerline of the stripe.

4. Traffic stripes and pavement markings shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.
5. STOP and YIELD legend pavement markings and limit lines are required with corresponding signs. The yield limit line shall be per the CAMUTCD with CS (24" by 36" triangles).
6. Pavement arrows shall be one of the following types unless otherwise directed by the Engineer: Type II (L, R or B), Type III (L, R, or B), Type VI or Bike Lane Arrow.
7. At signalized intersections with left turn lanes longer than 150 feet, an additional Type II, or Type III arrow shall be placed 20 feet behind the limit line. Where there are dual left turn lanes with staggered limit lines, the arrows in the number 1 left turn lane (closest to the median) shall be placed 15 feet behind the limit line, and the arrow in the number 2 left turn lane shall be placed 20 feet behind the limit line. The intent is to have the 2 arrows line up side by side, even though the limit lines are staggered.
8. All turn lanes shall have a Type II or Type III arrow at the beginning of the turn lane such that the tail of the arrow lines up with the beginning of the Detail 38 striping. All turn lanes 150 feet or longer shall have a minimum of 2 Type II or Type III arrows (one arrow for every 150 feet of turn lane).
9. All traffic lane striping shall be discontinued through any 4 way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For non-signalized public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T". However, there shall be no striping within the limits of the crosswalk.
10. At locations where bike lane striping is used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both strips shall be detail 38. Reflective pavement markers shall be placed to the vehicle travel lane side of both stripes.
11. Bike lane striping shall be continuous except at right turn bay tapers, intersections with City streets, and driveways where the centerline/median is broken. See TS-18 for examples.
12. Lanes designated by the Engineer as auxiliary shall be striped as directed by the Engineer. Examples of typical auxiliary lane striping can be seen on TS-19. Bike lane striping along auxiliary lanes shall be a modified Detail 38 with 4 foot stripes at 10 feet on center.
13. Left turn arrows shall not be placed in 2 Way Left Turn Lanes unless otherwise directed by the Engineer.
14. Stop bars and yield triangles shall be 7 feet back from the center of the pedestrian access ramp unless directed otherwise by the Engineer. Where the stop sign is installed with a yellow school crosswalk, a supplemental white stop bar shall be installed 4 feet back from the crosswalk line.

15. Lane line extensions for dual turning lanes (right and left) shall be placed on a continuous arc as appropriate for a turning 40 foot bus. Triple turning lanes shall be placed to accommodate the turning of a 65 foot total length (California legal) tractor truck-semitrailer (TS-20).

### **84-2.03 THERMOPLASTIC TRAFFIC STRIPES & PAVEMENT MARKINGS**

The thermoplastic material shall conform to State Specification PTH-02ALKYD:

Thermoplastic Traffic Striping Material, Alkyd Binder, White and Yellow. All thermoplastic must be applied per section 84-2.03C(2)(b)(CalTrans latest edition) Extruded Thermoplastic Traffic Stripes and Pavement Markings.

#### **A. APPLICATION**

The Contractor shall apply an adhesive primer base coat prior to the application of any thermoplastic material on treated pavement, stamped pavement, colored pavement, concrete surfaces, or pavement older than 30 days.

As shown on the plans, the following permanent traffic lane striping shall be thermoplastic, and placed as one of the following types: Detail 2, 6 ,9A, 12A, 16, 19, 22, 25, 27B, 29, 32, 34, 35, 36, 36B, 37, 38, 39, 39A, 40, 41, 42, 43, 44, 45