

## SECTION 32 17 23 - PAVEMENT MARKINGS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Removal of existing traffic stripes and pavement markers
- B. Removal of existing signs
- C. Cleaning and sweeping of streets before application of traffic stripes and pavement markings
- D. Materials and application for traffic stripes and pavement markings
- E. Materials and application for pavement markers
- F. Traffic control signs and street name signs
- G. Object markers
- H. Survey monuments

#### 1.2 RELATED SECTIONS

- A. Section 32 13 18, Cement and Concrete for Exterior Improvements

#### 1.3 RELATED DOCUMENTS

- A. Caltrans Standard Specifications, 2018
  - 1. Section 78, Incidental Construction
  - 2. Section 81, Miscellaneous Traffic Control Devices
  - 3. Section 82, Signs and Markers
  - 4. Section 84, Markings
- B. Caltrans Standard Plans, 2018
  - 1. Plan A20A through A20D: Pavement Markers and Traffic Lines, Typical Details
  - 2. Plan A24A and A24B: Pavement Markings Arrows
  - 3. Plan A24C: Pavement Markings, Symbols and Numerals
  - 4. Plan A24D: Pavement Markings, Words
  - 5. Plan A24E: Pavement Markings, Words, Limit and Yield Lines
  - 6. Plan A24F: Pavement Markings, Crosswalks
  - 7. Plan A73A: Object Markers
  - 8. Plan A73B: Markers
  - 9. Plan A73C: Delineators, Channelizers and Barricades
  - 10. Plan A74: Survey Monuments
  - 11. Plan RS1: Roadside Sign, Typical Installation Details No. 1
  - 12. Plan RS2: Roadside Sign, Wood Post - Typical Installation Details No. 2

- 13. Plan RS3: Roadside Sign, Laminated Wood Box Post - Typical Installation Details No. 3
- 14. Plan RS4: Roadside Sign, Typical Installation Details No. 4

- C. The State of California Traffic Manual, 2014
- D. The regulations, standards, and tests of the State of California Department of Transportation Materials and Research Division, edition in effect at time of date on Plans.
- E. Professional Land Surveyor's Act, Business and Professions Code §§ 8700 – 8805

#### 1.4 SUBMITTALS

- A. Submit product data for each of the following in accordance with Section 01 10 00, Supplemental General Requirements:
  - 1. Traffic paint
  - 2. Pavement markers and adhesives
  - 3. Reflectorized markers and posts

#### 1.5 QUALITY ASSURANCE

- A. Deliver certificates showing conformance with this specification to the Owners Representative with each shipment of materials and equipment to the Project site.
- B. Provide proper facilities for handling and storage of products to prevent damage. Where necessary, stack products off ground on level platform, fully protected from weather.

#### 1.6 PROJECT CONDITIONS

- A. Do not apply traffic striping or pavement markings to the pavement until after approval to proceed has been given by the Owners Representative.
- B. Thoroughly cure new asphalt concrete and portland cement concrete before application of stripes, markings or markers.

### PART 2 - PRODUCTS

#### 2.1 THERMOPLASTIC STRIPES AND MARKING

- A. Thermoplastic striping and marking materials shall be in accordance with Caltrans Standard Specifications Sections 84-2.02 and 84-2.02B, unless noted otherwise herein or on the Plans.
- B. Glass Beads shall be in accordance with Caltrans Standard Specification Section 84-2.02D, Glass Beads, unless noted otherwise herein or on the Plans.
- C. Thermoplastic stripes and markings shall have a minimum skid friction value of BPN 35.

## 2.2 PAINTED STRIPES AND MARKINGS

- A. Painted striping and marking materials shall be in accordance with Caltrans Standard Specifications Sections 84-2.02 and 84-2.02C, unless noted otherwise herein or on the Plans.
- B. Glass Beads shall be in accordance with Caltrans Standard Specification Section 84-2.02D, Glass Beads, unless noted otherwise herein or on the Plans.

## 2.3 PAVEMENT MARKERS

- A. Pavement Markers shall be in accordance with Caltrans Standard Specification Section 81-3, Pavement Markers, and as indicated on the Plans.
- B. Material
  - 1. Non-reflective Material shall be in accordance with Caltrans Standard Specification Section 81-3.02B, Non-Reflective Pavement Markers.
  - 2. Retroreflective Material shall be in accordance with Caltrans Standard Specification Section 81-3.02C, Retroreflective Pavement Markers.
- C. Adhesive:
  - 1. Adhesive Material shall be in accordance with Caltrans Standard Specification Section 81-3.02D, Hot Melt Bituminous Adhesive.

## 2.4 TRAFFIC CONTROL SIGNS

- A. General: Traffic control signs shall be in accordance with Caltrans Standard Specification Section 82-1, Signs and Markers.
- B. Posts:
  - 1. Metal Posts shall be in accordance with Caltrans Standard Specification Section 82-3.02B, Metal Posts.
  - 2. Wood Posts shall be in accordance with Caltrans Standard Specification Section 82-3.02C, Wood Posts.
- C. Mounting Hardware shall be in accordance with Caltrans Standard Specification 82-3.02E, Sign Panel Fastening and Mounting Hardware, unless otherwise specified.
- D. Post Foundations: Conform to Caltrans Standard Plans.

## 2.5 REFLECTORIZED OBJECT MARKERS

- A. ReflectORIZED Metal Object Markers: In accordance with Caltrans Standard Specification Section 82-5, Markers, for target plates and reflectors, and Caltrans Standard Plans A73A through A73C. Marker type shall be as shown on Plans. *[Select type of object marker.]*
- B. Posts: Metal posts shall be in accordance with Caltrans Standard Specification Section 82-5.02C, Metal Posts, and Caltrans Standard Plan A73B.

- C. Mounting Hardware: In accordance with Caltrans Standard Specification Section 82-5.02G, Hardware.

## 2.6 STREET SURVEY MONUMENTS

- A. General: In accordance with Caltrans Standard Specification Section 78-2, Survey Monuments, except that the marker disk will not be furnished. Marker disk shall be 2 inch diameter solid brass with a 2 ¾ inch shaft, "Lietz No. 525" or approved equal.
  - 1. Portland Cement Concrete: In accordance with Section 32 13 18, Cement and Concrete for Exterior Improvements.

## PART 3 - EXECUTION

### 3.1 REMOVAL OF TRAFFIC STRIPES, PAVEMENT MARKINGS AND PAVEMENT MARKERS

- A. Where blast cleaning is used for the removal of painted traffic stripes and pavement markings, or for removal of objectionable material, remove the residue, including dust and water, immediately after contact with the surface being treated. Remove by a vacuum attachment operating concurrently with the blast cleaning operation.
- B. Where grinding is used for the removal of thermoplastic traffic stripes and pavement markings; remove the residue by means of a vacuum attachment to the grinding machine. Do not allow the residue to flow across or be left on, the pavement.
- C. Where markings are to be removed by blast cleaning or by grinding, the removed area shall be approximately rectangular so that no imprint of the removed marking remains on the pavement.  
*[Use the following if yellow painted stripes will be removed.]*
- D. Waste from removal of yellow painted traffic stripe may contain lead chromate. Residue produced when yellow paint is removed may contain heavy metals in concentrations that exceed thresholds established by the California Health and Safety Code and may produce toxic fumes when heated. As such, when grinding or other methods approved by the Owner's Representative are used to remove yellow painted traffic stripes, the removed residue, including dust, shall be collected and contained immediately. The Contractor shall submit a written work plan for the removal, storage, and disposal of yellow painted traffic stripe to the Owner's Representative for approval not less than fifteen (15) days prior to the start of the removal operations. Removal operations shall not be started until the Owner's Representative has approved the work plan.
- E. Contractor will be responsible for repairing any damage to the pavement during removal of pavement markers. Damage to the pavement, resulting from removal of pavement markers, shall be considered as any depression more than 1/4-inch deep.

### 3.2 TEMPORARY PAVEMENT MARKERS

- A. If permanent pavement markers cannot be installed immediately, and the street or road is to be placed in service, install short term, temporary pavement markers on the new pavement prior to opening the street or road to traffic.
- B. Place markers, at a minimum, of 24 feet on centers, or as required by the governmental agency having jurisdiction, in the appropriate colors to delineate centerlines and travel lanes on multi-lane roadways.

### 3.3 THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS

- A. Apply in conformance with the manufacturer's instructions and the applicable requirements Caltrans Standard Specification Section 84-2.03, Construction, and Caltrans Standard Plans A20A through A20D, and A24A through A24E.

### 3.4 PAINTED TRAFFIC STRIPES AND PAVEMENT MARKINGS

- A. Apply in conformance with the manufacturer's instructions and the applicable requirements of Caltrans Standard Specification Section 84-3.03, 3.04 and 3.05 and Caltrans Standard Plans A20A through A20D, and A24A through A24F.

### 3.5 PAVEMENT MARKERS

- A. Place in accordance with Caltrans Standard Specification Section 81-3.03, Construction.
- B. Pavement recesses are not required. Markers shall be installed accurately to the line established by the Owner's Representative. No markers shall be installed until the surface has been approved by the Owner's Representative.

### 3.6 TRAFFIC CONTROL SIGNS

- A. Install in accordance with Caltrans Standard Specification Sections 82-2.03 and 82-3.03, Caltrans Standard Plan RS1, the applicable requirements of the State of California Department of Transportation Maintenance Manual and the details shown on the Plans. The horizontal locations shown on Caltrans Standard Plan RS1 shall not be applicable, the horizontal location shall be as shown on the Plans.
- B. Portland cement concrete for post foundations shall be of the configuration shown on the Plans.
- C. After erection, damage to traffic sign faces shall be touched up or the sign replaced.

### 3.7 REFLECTORIZED OBJECT MARKERS.

- A. Install in accordance with Caltrans Standard Specification Section 82-5.03, Construction, except that the metal marker posts shall not be driven in place without prior approval of the Owner's Representative.
- B. Install at locations shown on the Plans.

### 3.8 STREET SURVEY MONUMENTS

- A. Install Survey Monuments in accordance with Caltrans Standard Specification Section 78-2.03, Construction and Caltrans Standard Plan A74, except that the marker disk will not be furnished. Exact point in marker to be determined by an accurate survey and placed by a California Licensed Land Surveyors in accordance with the Professional Land Surveyors' Act.

### 3.9 PROTECTION

- A. Protect the newly installed traffic stripes and pavement markings from damage until the material has cured.
- B. Replace any traffic stripes or pavement markings or markers broken, misaligned or otherwise disturbed prior to opening roadway to traffic.

### 3.10 RESTORATION OF EXISTING IMPROVEMENTS

- A. Existing signs striping or other markings removed or damaged due to the installation of new facilities shall be replaced in kind.
- B. Existing landscaping or planting removed, damaged or disturbed due to the installation of traffic control signs or street name signs shall be replaced in kind.

END OF SECTION