

**SECTION 01423****TUBULAR MARKERS FOR MAINTENANCE OF TRAFFIC****01423.01 GENERAL****A. Description**

This work shall consist of furnishing and installing, complete in place, tubular markers for maintenance of traffic. Tubular markers shall be used to provide reflective delineation for channelizing traffic through the construction areas or detours as indicated on the approved Traffic Control Plan (TCP) or as directed by the Engineer.

**B. Related Work Included Elsewhere**

Traffic control plan; Section 01411.

**C. Quality Assurance**

1. The Engineer will inspect all materials before and/or after installation to ensure compliance with the Contract Documents.

2. Tubular markers shall meet the following minimum test requirements

a. Impact Resistance

To measure each delineator's reaction to vehicle impact, the delineator shall be attached to a road surface and struck by a vehicle at various speeds. Results after each impact shall be recorded. The first two impacts shall be at 20 mph; the next two impacts at 40 mph; then two final impacts shall be conducted at 60 mph. The tubular markers shall not damage vehicles nor change the traffic pattern upon impact, and the delineators shall be self-righting after impact testing.

b. Temperature

The delineators shall withstand high and low temperatures and still be self-supporting. They shall remain upright after four hours of exposure at 140 Degrees Fahrenheit. Likewise, after four hours of exposure to temperatures of -8 Degrees Fahrenheit a tubular marker shall be capable of being bent over 180 degrees with no distress.

**D. Submittals**

A certificate of compliance shall be submitted as specified in the "General Provisions" for tubular markers stating that they meet the requirements and have demonstrated compliance with the test specified herein.

**01423.02 MATERIALS****A. Materials Furnished by the County**

The County will not furnish any materials for tubular marker installation.

**B. Contractor's Options**

Not applicable.

**C. Detailed Material Requirements**

1. Tubular markers shall consist of a snap back delineator post and base that can be secured to any pavement with epoxy. The post with base shall be a minimum height of 36 inches and have a minimum outside diameter of 2.3 inches. The posts shall be made of materials to withstand impact without damage to themselves or to vehicles and shall return to the original upright position after impact.
2. No paint shall be used on either the post or base so they remain maintenance free. Reflectorization of tubular markers shall be a minimum of two 3-inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between the bands. The posts shall have a detachable base, no more than 2 inches in height, which may be mated to a new tubular marker when the original marker fails because of repeated vehicle impact. Reflectorized materials shall have a smooth, sealed outer surface, which shall display the same approximate color day and night. Color shall be in accordance with the Manual on Uniform Traffic Control Devices or as noted on the TCP.

**01423.03 EXECUTION**

All materials, equipment, and services necessary for the complete installation of the tubular markers, as indicated on the approved TCP, shall be as prescribed by the manufacturer furnishing the material.

**01423.04 METHOD OF MEASUREMENT****A. Tubular Marker Installation**

Measurement for tubular marker installation for maintenance of traffic will be made of the actual number of tubular markers installed in place, completed and accepted by the Engineer. Removal of tubular markers will not be measured and shall be incidental to installation.

**B. Tubular Marker Replacement**

Measurement for tubular marker replacement for those that are damaged as result of traffic operations will be made of the actual number of tubular marker reinstalled in place, complete and accepted by the Engineer.

**01423.05 BASIS OF PAYMENT****A. Tubular Marker Installation**

Payment for tubular marker installation for maintenance of traffic will be made at the price bid each. Payment will include all labor, materials, equipment, and incidentals necessary to install and remove this item as specified by the TCP and the Engineer.

**B. Tubular Marker Replacement**

Payment for replacement tubular markers will be made at the price bid each and will include the removal of the damaged tubular marker and its parts and all labor, materials, equipment, and incidentals necessary to install a replacement as specified by the TCP and the Engineer.

**C. Ownership of Removed Materials**

Tubular marker material, including all associated hardware, fittings, posts, and incidentals, when satisfactorily removed from the project site, shall become the property of the Contractor.