

**Item No. 870S**  
**Work Zone Pavement Markings**

**870S.1 Description**

This item shall govern the placement and maintenance of work zone pavement markings of the colors, types and sizes indicated on the Drawings.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text and accompanying tables, inch-pound units are given preference followed by SI units shown within parentheses.

**870S.2 General**

Work zone pavement markings shall consist of guide marks, short-term markings and/or standard pavement markings. Existing markings are considered to be any standard pavement markings in place at the time of commencement of the Work. All streets, which are to be opened to traffic, shall be marked with short-term markings or standard markings, as shown on the Drawings, at the end of each day of operation.

When inclement weather prohibits the application of short-term markings or standard markings indicated on the Drawings, guide marks may be considered as temporary short-term markings for asphaltic surfaces, upon approval by the Engineer. The placement of pavement markings as shown on the Drawings may be delayed until the time that weather conditions allow the application of pavement markings.

**870S.3 Materials**

All non-removable markings shall be thermoplastic, unless otherwise indicated on the Drawings. Thermoplastic markings shall have a thickness of 90 mils (2.3 millimeters) unless indicated otherwise on the Drawings. All non-removable work zone markings shall conform to the requirements of Specification Item 871S, "Reflectorized Pavement Markings", except for Section 871C.5, 'Performance Period for Type I Markings', Section 871C.6, 'Measurement' and Section 871C.7, 'Payment'.

Thermoplastic or paint and beads applications shall not be used for removable markings.

Unless otherwise shown on the Drawings or indicated in the Contract Documents:

The Contractor shall have the option to use raised pavement markers to simulate standard markers in accordance with the Drawings. Longitudinal lines wider than four (4) inches {100 millimeters} may be simulated by the side-by-side placement of markers to increase the apparent line width in multiples of four (4) inches {100 millimeters}.

Removable work zone pavement markings on final pavement surfaces shall be removable tape conforming to TxDOT Departmental Materials Specification DMS-8241.

When raised reflective pavement markers are required on the Drawings to supplement the removable pavement markings, a marker shall be applied to the top of the tape at the approximate mid-length of tape used for broken lines and at approximate 20 foot (6 meter) spacing for solid lines.

Raised pavement markers will not be allowed for words, symbols, shapes and diagonal or transverse lines.

The paint shall be water-based and shall conform to Standard Specification Item 860S, "Pavement Marking Paint".

The beads shall conform to Standard Specification Item 860S, "Pavement Marking Paint".

The thermoplastic type materials shall conform to TxDOT Departmental Materials Specification Item DMS-8220, "Thermoplastic Pavement Markings".

#### **870S.4 Performance Requirements**

The markings in construction areas shall remain in proper alignment and shall be distinctly visible when dry from a minimum distance of 300 feet (90 meters) in daylight hours and distinctly visible from a minimum distance of 120 feet (36 meters) at night, when illuminated by automobile low-beam headlights. The visibility distances will be determined when viewed from an automobile traveling on the street.

The daytime color and the nighttime reflected color of the markings shall be distinctly white or yellow as shown on the Drawings. The markings shall exhibit uniform retroreflective characteristics.

#### **870S.5 Construction Methods**

##### **A. Placement and Maintenance.**

The Contractor shall exercise due diligence in the selection of materials and placement of work zone pavement markings. The Contractor at its own expense shall maintain work zone pavement markings to the satisfaction of the Engineer or designated representative in accordance with this Specification Item.

Unless approved otherwise in writing by the Engineer or designated representative, all Portland cement concrete surfaces shall have standard markings in place prior to opening to traffic.

All asphaltic surfaces, which are scheduled for opening to traffic, shall be marked with guide marks immediately following placement and final rolling of any course. Guide marks shall consist of a single temporary flexible-reflective street marker tab or a single temporary construction raised reflective pavement marker at 40-foot (12-meter) spacing.

Guide marks shall be placed in proper alignment with the final location of future standard markings. Any guide marks, which are not in alignment with standard markings, shall be removed by the Contractor at its own expense.

The standard pavement markings shall be installed in accordance with the Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD) and as shown on the Drawings.

Surfaces to receive surface treatments (Standard Specification Item 320S) shall be marked in accordance with the Drawings. Unless otherwise shown on the Drawings, the standard pavement markings shall be placed in accordance with TMUTCD, no sooner

than three (3) days nor later than two (2) weeks after the placement of the surface treatment.

Short-term markings required by the Drawings shall conform to the TMUTCD and details shown on the Drawings. Unless otherwise shown on the Drawings, short-term markings shall be removed immediately prior to placement of the final pavement markings.

#### B. Marking Removal.

Any work zone pavement markings placed by the Contractor that conflict with any succeeding work zone markings shall be removed by the Contractor at its own expense in accordance with Specification Item 874S, "Eliminating Existing Pavement Markings and Markers", except for measurement and payment.

Removable marking materials shall leave minimal evidence of the existence of the marking upon removal.

#### C. Maintenance of Markings

The Contractor shall be responsible for maintaining all work zone pavement markings in accordance with this specification item, at its own expense, to the satisfaction of the Engineer or designated representative.

### **870S.6 Measurement**

This Standard Specification Item will be measured by the lineal foot (lineal meter: 1 lineal meter is equal to 3.281 lineal feet) of standard marking or short-term marking, by each guide mark, by each word, shape or symbol, by each temporary flexible-reflective street marker tab on surface treatments or by any other unit as shown on the Drawings. Raised pavement markers used to simulate a stripe will be measured by the lineal foot (lineal meter) of simulated stripe or each raised pavement marker as shown on the Drawings. Where double stripes are placed, each stripe will be measured separately.

Payment for revised quantities will be paid for at the unit price bid for that bid item.

### **870S.7 Payment**

The work performed and materials furnished in accordance with this Standard Specification Item and measured as provided under "Measurement" will be paid for at the Unit bid price for "Work Zone Pavement Markings (Removable)", "Work Zone Pavement Markings (Non-removable)", "Work Zone Pavement Markings (Short-Term)" and "Work Zone Pavement Markings (Guide mark)" of the width, color and type shown on the Drawings. This price shall include full compensation for furnishing all materials, labor, tools, equipment and incidentals necessary to place, maintain and remove, when required, the markings, except as described below.

Removal of existing markings will be paid for under Specification Item 874S, "Eliminating Existing Pavement Markings and Markers".

Final work zone pavement markings (paint and beads) which will be used within 30 calendar days after application as a sealer for Type I pavement markings will not be paid for under this Specification Item, but will be paid for under Specification Item 871S, "Reflectorized Pavement Markings".

Payment will be made under one or more of the following:

<b>Pay Item 870S-A:</b>	Work Zone Pavement Markings (Removable), ____inches in width, _____ in color	per lineal foot.
<b>Pay Item 870S-B:</b>	Work Zone Pavement Markings (Non-removable), ____inches in width, _____ in color	per lineal foot.
<b>Pay Item 870S-C:</b>	Work Zone Pavement Markings (Short Term), ____inches in width, _____ in color	per lineal foot.
<b>Pay Item 870S-D:</b>	Work Zone Pavement Markings (Guide mark), ____inches in width, _____ in color	per lineal foot.
<b>Pay Item 870S-E:</b>	Work Zone Pavement Marking (Removable), Words	per each.
<b>Pay Item 870S-F:</b>	Work Zone Pavement Marking (Removable), Symbols	per each.
<b>Pay Item 870S-G:</b>	Work Zone Pavement Marking (Non-removable), Words	per each.
<b>Pay Item 870S-H:</b>	Work Zone Pavement Marking (Non-removable), Symbols	per each.

**END**

**SPECIFIC CROSS REFERENCE MATERIALS**

City of Austin Contract Documents

<u>Designation</u>	<u>Description</u>
Section 00300U	Bid Form (Unit Price)

City of Austin Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. 320S	Two Course Surface Treatment
Item No. 860S	Pavement Marking Paint (Reflectorized)
Item No. 871S	Reflectorized Pavement Markings
Item No. 874S	Eliminating Existing Pavement Markings and Markers

**RELATED CROSS REFERENCE MATERIALS**

City of Austin Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. 302S	Aggregates for Surface Treatments
Item No. 310S	Emulsified Asphalt Treatment
Item No. 311S	Emulsified Asphalt Repaving
Item No. 312S	Seal Coat
Item No. 313S	Cleaning and/or Sealing Joints and Cracks (Asphaltic Concrete)
Item No. 315S	Milling Asphaltic Concrete Paving
Item No. 340S	Hot Mix Asphaltic Concrete Pavement
Item No. 341S	Paving Fabric
Item No. 350S	Heating, Scarifying and Repaving
Item No. 360	Concrete Pavement
Item No. 413S	Cleaning and/or Sealing Joints and Cracks (Portland Cement Concrete)
Item No. 801S	Construction Detours
Item No. 803S	Barricades, Signs and Traffic Handling

Item No. 863S	Reflectorized Pavement Markers
Item No. 864S	Abbreviated Pavement Markings
Item No. 865S	Non-Reflectorized Traffic Buttons
Item No. 866S	Jiggle Bar Tile
Item No. 867S	Epoxy Adhesive
Item No. 872S	Prefabricated Pavement Markings
Item No. 873S	Raised Pavement Markers
Item No. 875S	Pavement Surface Preparation For Markings

City of Austin Standard Details

<u>Designation</u>	<u>Description</u>
863S-1	Pavement Buttons (Reflectorized-Type I & Type II)
865S-1	Traffic Buttons (Non-Reflectorized)

Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges

<u>Designation</u>	<u>Description</u>
Item No. 302	Aggregates for Surface Treatments
Item No. 314	Emulsified Asphalt Treatment
Item No. 315	Emulsified Asphalt Seal
Item No. 316	Surface Treatments
Item No. 334	Hot Mix-Cold Laid Asphaltic Concrete Pavement
Item No. 340	Hot Mix Asphaltic Concrete Pavement
Item No. 342	Plant Mix Seal
Item No. 351	Repairing Existing Flexible Pavement Structure
Item No. 354	Planing and/or Texturing Pavement
Item No. 358	Asphaltic Concrete Surface Rehabilitation
Item No. 360	Concrete Pavement
Item No. 421	Hydraulic Cement Concrete
Item No. 427	Surface Finishes for Concrete
Item No. 428	Concrete Surface Treatment
Item No. 662	Work Zone Pavement Markings
Item No. 666	Reflectorized Pavement Markings
Item No. 667	Prefabricated Pavement Markings
Item No. 672	Raised Pavement Markers
Item No. 677	Eliminating Existing Pavement Markings and Markers
Item No. 678	Pavement Surface Preparation For Markings

**RELATED CROSS REFERENCE MATERIALS - Continued**Texas Department of Transportation:  
Manual of Testing Procedures

<u>Designation</u>	<u>Description</u>
Tex-729-I	Sampling of Traffic Markers
Tex-732-I	Sampling of Prefabricated Pavement Marking Materials
Tex-828-B	Determining Functional Characteristics of Pavement Markings
Tex-829-B	Method For Measuring Pavement Temperature
Tex-854-B	Evaluation Of Thermoplastic Striping For Uniformity And Thickness

Texas Department of Transportation: Departmental Materials Specifications

<u>Designation</u>	<u>Description</u>
DMS-4100	Jiggle Bar Tile
DMS-4200	Pavement Markers (Reflectorized)
DMS-4300	Traffic Buttons

DMS-4210	Pavement Markers
DMS-6130	Bituminous Adhesive
DMS-8200	Pavement Paint
DMS-8220	Thermoplastic marking material
DMS-8240	Prefabricated Marking Materials
DMS-8241	Removable Tape
DMS-8290	Pavement Paint
YPT-10 and/or	
WPT-10	Pavement Paint