

Item No. 873S
Raised Pavement Markings

873S.1 Description

This item shall govern furnishing and installation of raised pavement markings of various classes and types shown.

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

873S.2 Materials

Raised pavement marking materials shall comply with the requirements of City of Austin Specification Items and TxDOT Materials Specifications as follows:

- Class A, Jiggle Bar Tile: Standard Specification Item No. 867S,
- Class B, Pavement Markers (Reflectorized): Standard Specification Item No. 863S;
- Class C, Traffic Buttons: TxDOT DMS-4300;
- Class D, Traffic Buttons (Oval): TxDOT DMS-4300;
- Class E, Pavement Markers (All Weather Reflectorized): TxDOT DMS-4210.

Raised pavement markers shall be of the following classes and types:

- Class A, Raised Pavement Markers (Jiggle Bar Tile): Class A raised pavement markers shall include types: I-A, I-C, II-A-A, W and Y.
- Class B, Raised Pavement Markers (Pavement Markers, Reflectorized): Class B raised pavement markers shall include types: I-A, I-C, II-A-A and II-C-R.
- Class C and D, Raised Pavement Markers (Traffic Buttons): Class C and D raised pavement markers shall include types: I-A, I-C, I-R, II-A-A, II-C-R, W and Y.
- Class E Raised Pavement Markers (All-Weather Reflectorized): Class E raised pavement markers shall include types: I-A, I-C, I-R, II-A-A and II-C-R.

The following are descriptions for each type of raised pavement marker:

- Type I-A. Type I-A shall contain an approach face that reflects amber light. The body, other than the reflective face, shall be yellow.
- Type I-C. Type I-C shall contain an approach face that reflects white light. The body, other than the reflective face, shall be white, silver-white or light gray.
- Type I-R. Type I-R shall contain a trailing face that reflects red light. The body, other than the reflective face, shall be white, silver-white or light gray or may be one-half red on the side which reflects red light.
- Type II-A. Type II-A shall contain two (2) reflective faces (approach and trailing), each of that shall reflect amber light. The body, other than the reflective face, shall be yellow light.
- Type II-C-R. Type II-C-R shall contain two (2) reflective faces (approach and trailing), an approach face, which shall reflect white light, and a trailing face, which shall reflect red light. The body, other than the reflective face, shall be white, silver-white or light gray. Optionally, the body may be one-half white, silver-white or light gray on the side that reflects white light and one-half red on the side that reflects red light.
- Type W. Type W shall have a white body and no reflective faces.
- Type Y. Type Y shall have a yellow body and no reflective faces.

The reflective faces of all Type II markers shall be positioned so that the direction of reflection of one face shall be directly opposite to the direction of the other face.

Bituminous adhesive shall conform to the requirements of TxDOT Departmental Materials Specification DMS-6130. Epoxy adhesive shall conform to the requirements of Standard Specification Item 867S, "Epoxy Adhesive".

873S.3 Sampling.

Sampling will be conducted in accordance with TxDOT Test Method Tex-732-I.

873S.4 Construction Methods

Each class of raised pavement marker shall be provided from the same manufacturer.

Surfaces to which markers are to be attached by an adhesive shall be prepared by any method approved by the Engineer or designated representative to ensure that the surface is free of dirt, curing compound, grease, oil, moisture, loose or unsound pavement markings and any other material which would adversely affect the adhesive bond. Unless otherwise shown on the Drawings, surface preparation for installation of raised pavement markers will not be paid for directly, but shall be included in the unit price bid for this Standard Specification Item.

Guides to mark the lateral location of pavement markings shall be established as shown on the Drawings or as directed by the Engineer or designated representative. The Contractor shall establish the pavement marking guide and the Engineer or designated representative will verify the location of the guides prior to installation.

The pavement markings shall be placed in proper alignment with the guides. The deviation rate in alignment shall not exceed 1 inch per 200 feet {25 mm per 60 meters} of street. The maximum deviation shall not exceed 2 inches {50 millimeters} nor shall any deviation be abrupt.

Markings placed that are not in alignment or sequence, as shown on the drawings or as stated in the Specification Item, shall be removed by the Contractor at its expense. Removal shall be in accordance with Standard Specification Item 874S, "Eliminating Existing Pavement Markings and Markers", except for measurement and payment. Guides placed on the street for alignment purposes shall not establish a permanent marking on the street.

Unless shown otherwise on the Drawings, the Contractor shall use the following adhesive materials for placement of markers:

- Epoxy adhesive for Class E markers;
- Bituminous adhesive for Class A, B, C and D markers on bituminous pavements;
- Epoxy adhesive for Class A, B, C and D markers on p. c. concrete pavements.

Adhesive shall be applied in sufficient quantity to ensure the following:

- 100% of the bonding area of raised pavement markers shall be in contact with the adhesive;
- Raise pavement markers, except Class E, shall not be in contact with the pavement surface but shall be seated on a continuous layer of adhesive.

Unless otherwise required by this Specification Item, adhesives shall be applied in accordance with the manufacturer's recommendations. When bituminous adhesive is used, pavement and raised pavement marker temperature shall be at least 40⁰F (5⁰C). The

bituminous adhesive shall not be heated above 400⁰F (204⁰C). The bituminous adhesive shall be agitated intermittently to ensure even heat distribution.

Epoxy adhesive shall be machine mixed.

Raised pavement markers shall be free of rust, scale, dirt, oil, grease, moisture or contaminants, which might adversely affect the adhesive bond.

Raised pavement markers shall be placed immediately after the adhesive is applied and shall be firmly bonded to the pavement. Adhesive or any other material that impairs functional reflectivity will not be acceptable.

873S.5 Measurement

This Specification Item will be measured as each raised pavement marker.

873S.6 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 "Raised Pavement Markings" of the classes and types. This price shall include full compensation for furnishing all materials, surface preparation, installation, labor, tools, equipment and incidentals necessary to complete the Work.

Payment shall be made by one or more of the following:

Pay Item 873S-A:	Class A, Raised Pavement Markings, ____ Type	per each.
Pay Item 873S-B:	Class B, Raised Pavement Markings, ____ Type	per each.
Pay Item 873S-C:	Class C, Raised Pavement Markings, ____ Type	per each.
Pay Item 873S-D:	Class D, Raised Pavement Markings, ____ Type	per each.
Pay Item 873S-E:	Class E, Raised Pavement Markings, ____ Type	per each.

END

<u>SPECIFIC</u> CROSS REFERENCE MATERIALS
Specification Item No. 873S, "Raised Pavement Markings"

City of Austin Standard 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. 863S	Reflectorized Pavement Markers
Item No. 866S	Jiggle Bar Tile
Item No. 867S	Epoxy Adhesive
Item No. 875S	Pavement Surface Preparation For Markings

Texas Department of Transportation: Manual of Testing Procedures

<u>Designation</u>	<u>Description</u>
Tex 732-I	Sampling of Prefabricated Pavement Marking Materials

Texas Department of Transportation: Departmental Materials Specification

<u>Designation</u>	<u>Description</u>
DMS-4210	Pavement Markers
DMS-4300	Traffic Buttons
DMS-6130	Bituminous Adhesive

<u>RELATED</u> CROSS REFERENCE MATERIALS
Specification Item No. 873S, "Raised Pavement Markings"

City of Austin Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. 301S	Asphalts, Oils and Emulsions
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	Rubber Asphalt Joint and Crack Sealant
Item No. 315S	Milling Asphaltic Concrete Paving
Item No. 320S	Two Course Surface Treatment
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. 801S	Construction Detours
Item No. 803S	Barricades, Signs and Traffic Handling
Item No. 860S	Pavement Marking Paint (Reflectorized)
Item No. 864S	Abbreviated Pavement Markings
Item No. 865S	Non-Reflectorized Traffic Buttons
Item No. 870S	Work Zone Pavement Markings
Item No. 871S	Reflectorized Pavement Markers
Item No. 872S	Prefabricated Pavement Markings
Item No. 874S	Eliminating Existing Pavement Markings and Markers

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)

<u>RELATED</u> CROSS REFERENCE MATERIALS - Continued
Specification Item No. 873S, "Raised Pavement Markings"

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
Texas Department of Transportation: <u>Manual of Testing Procedures</u>	
<u>Designation</u>	<u>Description</u>
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: <u>Departmental Materials Specification</u>	
<u>Designation</u>	<u>Description</u>
DMS-4100	Jiggle Bar Tile
DMS-4200	Pavement Markers (Reflectorized)
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