



## INTEROFFICE MEMORANDUM

**To:** Kent Cagle, City Manager

**FROM:** Jeffery Reynolds, Executive Director of Public Works

**DATE:** January 09, 2024

**SUBJECT: TRANSMITTAL LETTER OF AGREEMENT FOR THE FISCAL YEAR  
2024 PAVEMENT MARKING SERVICES BID 24-18**

Enclosed is the Letter of Agreement with D.I.J. Construction, Inc. The award of this agreement will be presented at Council Workshop on January 09, 2024, with a proposed Council approval date of January 16, 2024.

Upon Council approval of this agreement, the City Manager's signature will be required on page 5 (Memorandum is page 1) of this contract packet for execution. Once signed, please return to Public Works Transportation and Purchasing.

Thank you!

## LETTER OF AGREEMENT

This is a Letter of Agreement (“Agreement”) between the City of Killeen (referred to herein as “City”) and D.I.J. Construction, Inc. (referred to herein as “Contractor”), collectively the “Parties.”

In consideration of the premises and of the mutual covenants and agreements contained in this Agreement, the Parties hereby agree as follows:

Scope of Agreement. The purpose of this Agreement is to enlist the services of the Contractor to:

Provide pavement marking services as requested by the City during the term of this agreement in accordance with those specifications attached hereto as Exhibit A.

Term of Agreement. This Agreement shall become effective on the date that the last required signature is affixed and shall be effective for two (2) years. After the exhaustion of the entire contract term, the City may request up to an additional sixty (60) days past any contract term to advertise and award a new bid for such items without pricing adjustments.

Consideration. Contractor agrees to provide the services stated in accordance with the below line items per Bid number 24-18, Pavement Marking Services, in a total amount not to exceed \$350,000 for the first year of this Agreement and an amount to be later determined as appropriated by the City Council in accordance with the Fiscal Year 2025 annual budget for the second year:

Line No.	Item	Item Description	UOM	Bid Qty	Unit Cost
1	666-6005	ADDING REFL PAV MRK TYI(W)4”(DOT)(090MIL)	LF	1,500	\$2.05
2	666-6029	REFL PAV MRK TY I (W)8”(DOT)(090MIL)	LF	24	\$4.10
3	666-6035	REFL PAV MRK TY I (W)8”(SLD)(090MIL)	LF	4,546	\$2.40
4	666-6041	REFL PAV MRK TY I (W)12”(SLD)(090MIL)	LF	120	\$8.40
5	666-6047	REFL PAV MRK TY I (W)24”(SLD)(090MIL)	LF	1,290	\$19.00
6	666-6053	REFL PAV MRK TY I (W)(ARROW)(090MIL)	EA	79	\$250.00
7	666-6056	REFL PAV MRK TY I(W)(DBL ARROW)(090MIL)	EA	31	\$285.00
8	666-6077	REFL PAV MRK TY I (W)(WORD)(090MIL)	EA	8	\$275.00
9	666-6092	REFL PAV MRK TY I (W)(RR XING)(090MIL)	EA	10	\$830.00
10	666-6098	REF PAV MRK TY I(W)18”(YLD TRI)(090MIL)	EA	1	\$165.00
11	666-6110	REFL PAV MRK TY I(W)(BIKE SYML)(090MIL)	EA	200	\$165.00
12	666-6140	REFL PAV MRK TY I (Y)12”(SLD)(090MIL)	LF	200	\$11.00
13	666-6170	RERFL PAV MRK TY II(W)4”(PARKING)	LF	1,500	\$2.50
14	666-6299	RE PM W/RET REQ TY I (W)4”(BRK)(090MIL)	LF	48,639	\$0.95
15	666-6311	RE PM W/RET REQ TY I(Y)4”(BRK)(090MIL)	LF	1,500	\$0.95

16	666-6314	RE PM W/RET REQ TY I(Y)4"(SLD)(090MIL)	LF	1,500	\$0.95
17	672-6007	REFL PAV MRKR TY I-C	EA	240	\$10.00
18	672-6009	REFL PAV MRKR TY II-A-A	EA	5,000	\$6.60
19	672-6016	TRAFFIC BUTTON TY W	EA	5,000	\$5.00
20	672-6017	TRAFFIC BUTTON TY Y	EA	5,000	\$5.00
21	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	150,000	\$1.00
22	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	5000	\$2.00
23	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	2000	\$4.00
24	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	1500	\$8.00
25	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	80	\$90.00
26	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	35	\$95.00
27	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	10	\$95.00
28	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	10	\$175.00
29	677-6018	ELIM EXT PAV MRK & MRKS (18")(YLD TRI)	EA	1	\$175.00
30	677-6025	ELIM EXT PAV MRK & MARKS (BIKE SYMBOL)	EA	200	\$90.00

**Price Escalation.** Should market conditions prevail which dictate an increase, the successful contractor may submit documentation requesting permission to increase pricing no later than 90 days prior to the end of each twelve (12) months of contract. If the contractor fails to give timely notice, price may not be increased. Escalation may only occur after the initial twelve (12) months of this Agreement upon securing the approval of the City in writing. Request for price adjustments must be solely for the purpose of accommodating an increase in the contractor's cost, not profits.

**Independent Contractor.** Contractor shall act as an Independent Contractor. Under no circumstances shall Contractor be deemed an employee or partner of Owner.

**Applicable Laws.** Contractor shall follow all applicable local, State, and Federal laws, regulations, and requirements for the abatement and disposal of lead, asbestos, and other routinely encountered hazardous substances. If any unusual substances or extraordinary amounts of the aforementioned substances are encountered, the Contractor will contact the City to contact the State and the relevant agency with authority for regulation of the substance.

**Standard of Care.** The standard of care for all professional engineering and related services performed or furnished by Contractor under this Agreement will be the care and skill ordinarily used by members of the Contractor's profession practicing under similar circumstances at the same time and in the same locality.

Insurance. Contractor shall procure and maintain insurance in the following amounts:

Worker's Compensation	Statutory
Automobile Liability	\$500,000 Combined single Limit for each accident (Bodily injury and property damage).
General Liability	\$1,000,000 each occurrence (Bodily injury and property damage).
Professional Liability	\$1,000,000 general aggregate.

On all policies, except Worker's Compensation and Professional Liability, City shall be listed as an additional insured with a full waiver of subrogation. A certificate of coverage shall be provided to the City prior to commencing work on the Project.

Subcontracts and Assignments. Contractor's rights and obligations hereunder are deemed to be personal and may not be transferred or assigned. Any assignments shall be void and of no effect.

Indemnification. To the fullest extent permitted by law, City or Contractor, as applicable, shall indemnify and hold harmless the other party, and the other party's officers, directors, partners and employees from and against any and all costs, losses and damages (including, without limitation, all fees and charges of attorneys and other professionals, and all court or dispute resolutions costs) caused by the negligent acts or omissions of the City or Contractor, as applicable, or their respective officers, directors, partners, employees and consultants with respect to the performance under this Agreement or the Project.

Termination. This Agreement may be terminated by either party for cause upon thirty (30) calendar days' written notice, provided such cause cannot be reasonably cured within such thirty (30) day period. City may terminate this Agreement for convenience effective upon receipt of written notice declaring the same and Contractor shall be compensated for all work completed at that time in accordance with this Agreement.

Texas Law. This Agreement shall be subject to and governed by the laws of the State of Texas. The Parties agree that for venue purposes, any and all lawsuits, disputes, or causes of action shall be in Bell County, Texas.

Severability. If any provision of this Agreement shall, for any reason, be held to violate any applicable law, then the invalidity of such a specific provision in this Agreement shall not be held to invalidate the remaining provisions of this Agreement.

Survival. Any provision of this Agreement providing for indemnity, insurance or a duty that necessarily will not be completed until after the expiration or termination of this Agreement shall continue in full force and effect until such a time as all duties have been fully performed.

Non-waiver. Failure to enforce any provision of this Agreement by either party shall not constitute a waiver of that provision for purposes of the subsequent enforcement of that provision or the remainder of this Agreement.

Contract Verification. Texas law provides that a governmental entity may not enter into contracts over for goods and services valued at \$100,000 or more with a company that employs at least 10 full-time employees unless the company provides written verification regarding aspects of the company's business dealings. By signing, Contractor verifies the following:

- Texas Government Code, Chapter 2271 – the company must verify that it does not boycott Israel and will not boycott Israel during the term of the contract. Boycott Israel is defined in Government Code Chapter 808.



- Texas Government Code, Chapter 2274 – the company must verify that it does not boycott energy companies and will not boycott energy companies during the term of the contract. Boycott energy company is defined in Government Code Chapter 809.
- Texas Government Code, Chapter 2274 – the company must verify that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of the contract against a firearm entity or firearm trade association.

**Additional Funding Availability.** Projects may be funded in whole or part by U.S. Department of Housing and Urban Development Community Development Block Grant (CDBG) or Home Investment Partnerships Act and may be subject to submittal of certified payroll documentation as required by CDBG funded construction projects to the extent required by Davis-Bacon and Related Acts (DBRA); confirmation of eligibility for participation through the Excluded Parties Listing System (EPLS) – System for Award Management (SAM.gov) or the Texas Debarred Vendor List.

The city reserves the right to purchase all material / surfaces from the next most responsible vendor for failure to provide specified material / services in the contract at time of order or if materials are not available at time requested.

**Entire Agreement.** This Agreement shall represent the entire agreement by and between the Parties and it may not be changed except by written amendment duly executed by all Parties.

**SIGNED, ACCEPTED AND AGREED** to by the undersigned Parties, on the dates indicated, who acknowledge that they have read and understand this Agreement and that the Agreement is issued in accordance with local, State, and Federal laws, and the undersigned Parties hereby execute this legal document voluntarily and of their own free will.

**City of Killeen**

**Kent Cagle**  
**City Manager**

**Date**

**Contractor**

**Tim D. Jarma**

Digitally signed by Tim D. Jarma  
DN: cn=Tim D. Jarma, o=D.I.J. Construction,  
Inc., ou, email=tim@diijconstruction.com, c=US  
Date: 2023.12.12 14:43:30 -06'00'

**Signature**

**Date**

**Tim D. Jarma**

**Printed Name**

**Vice President / Estimator**

**Title of Signatory**

## **EXHIBIT A**

### **SPECIFICATIONS**

All specifications and special provisions applicable to this project are identified as follows:

**Standard Specifications: Adopted by the Texas Department of Transportation  
November 1, 2014.**

**Standard Specifications are incorporated into the contract by reference.**

The specifications cover the **minimum** requirements for the City's need for Pavement Marking Services. The specifications are not intended to eliminate any potential bidder from bidding; however, they are intended to outline the quality and service desired. If "exception" is the response, an explanation of the exception must be provided.

This specification covers the minimum requirements for Pavement Marking Services. The Services may be used by various City Departments. All invoices should be referred as:

"Attn: \_\_\_\_\_" (Department placing order).

Please note that the City's holiday listing noted in the "Information and Instructions to Bidders" may affect the delivery date of an order.

The City reserves the right to purchase services from the next most responsible bidder for failure to provide specified services in the contract at time of order or if services are not available at the time requested.

## Item 666

### Retroreflectorized Pavement Markings



#### 1. DESCRIPTION

Furnish and place retroreflectorized, non-retroreflectorized (shadow) and profile pavement markings.

#### 2. MATERIALS

##### 2.1. Type I Marking Materials. Furnish in accordance with DMS-8220, "Hot Applied Thermoplastic."

Furnish pavement marking material used for Type I profile markings and shadow markings that have been approved by the Construction Division, and in accordance with DMS-8220, "Hot Applied Thermoplastic."

##### 2.2. Type II Marking Materials. Furnish in accordance with DMS-8200, "Traffic Paint."

##### 2.3. Glass Traffic Beads. Furnish drop-on glass beads in accordance with DMS-8290, "Glass Traffic Beads" or as approved. Furnish a double-drop of Type II and Type III drop-on glass beads where each type bead is applied separately in equal portions (by weight), unless otherwise approved. Apply the Type III beads before applying the Type II beads.

##### 2.4. Labeling. Use clearly marked containers that indicate color, mass, material type, manufacturer, and batch number.

#### 3. EQUIPMENT

##### 3.1. General Requirements. Use equipment that:

- is maintained in satisfactory condition,
- meets or exceeds the requirements of the National Board of Fire Underwriters and the Texas Railroad Commission for this application,
- applies beads by an automatic bead dispenser attached to the pavement marking equipment in such a manner that the beads are dispensed uniformly and almost instantly upon the marking as the marking is being applied to the road surface. The bead dispenser must have an automatic cut-off control, synchronized with the cut-off of the pavement marking equipment,
- has an automatic cut-off device with manual operating capabilities to provide clean, square marking ends,
- is capable of producing the types and shapes of profiles specified, and
- can provide continuous mixing and agitation of the pavement marking material. The use of pans, aprons, or similar appliances which the die overruns will not be permitted for longitudinal striping applications.

Provide a hand-held thermometer capable of measuring the temperature of the marking material when applying Type I material.

When pavement markings are required to meet minimum retroreflectivity requirements on the plans:

- Use a mobile retroreflectometer approved by the Construction Division and certified by the Texas A&M Transportation Institute Mobile Retroreflectometer Certification Program.
- Use a portable retroreflectometer that:
  - uses 30-meter geometry and meets the requirements described in ASTM E1710;

- has either an internal global positioning system (GPS) or the ability to be linked with an external GPS with a minimum accuracy rating of 16 ft. 5 in., in accordance with the circular error probability (CEP) method (CEP is the radius of the circle with its origin at a known position that encompasses 50% of the readings returned from the GPS instrument);
- can record and print the GPS location and retroreflectivity reading for each location where readings are taken.

3.2.

**Material Placement Requirements.** Use equipment that can place:

- at least 40,000 ft. of 4-in. solid or broken non-profile markings per working day at the specified thickness;
- at least 15,000 ft. of solid or broken profile pavement markings per working day at the specified thickness;
- linear non-profile markings up to 8 in. wide in a single pass;
- non-profile pavement markings other than solid or broken lines at an approved production rate;
- a centerline and no-passing barrier-line configuration consisting of 1 broken line and 2 solid lines at the same time to the alignment, spacing, and thickness for non-profile pavement markings shown on the plans;
- solid and broken lines simultaneously;
- white line from both sides;
- lines with clean edges, uniform cross-section with a tolerance of  $\pm 1/8$  in. per 4 in. width, uniform thickness, and reasonably square ends;
- skip lines between 10 and 10-1/2 ft., a stripe-to-gap ratio of 10 to 30, and a stripe-gap cycle between 39-1/2 ft. and 40-1/2 ft., automatically;
- beads uniformly and almost instantly on the marking as the marking is being applied;
- beads uniformly during the application of all lines (each line must have an equivalent bead yield rate and embedment); and
- double-drop bead applications using both Type II and Type III beads from separate independent bead applicators, unless otherwise approved by the Engineer.

4.

## CONSTRUCTION

Place markings before opening to traffic unless short-term or work zone markings are allowed.

4.1.

**General.** Obtain approval for the sequence of work and estimated daily production. Minimize interference to roadway operations when placing markings on roadways open to traffic. Use traffic control as shown on the plans or as approved. Protect all markings placed under open-traffic conditions from traffic damage and disfigurement.

Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed, and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway.

Apply markings on pavement that is completely dry and passes the following tests:

- **Type I Marking Application**—Place a sample of Type I marking material on a piece of tarpaper placed on the pavement. Allow the material to cool to ambient temperature, and then inspect the underside of the tarpaper in contact with the pavement. Pavement will be considered dry if there is no condensation on the tarpaper.
- **Type II Marking Application**—Place a 1-sq. ft. piece of clear plastic on the pavement, and weight down the edges. The pavement is considered dry if, when inspected after 15 min., no condensation has occurred on the underside of the plastic.

Apply markings:

- that meet the requirements of Tex-828-B,
- that meet minimum retroreflectivity requirements when specified on the plans (applies to Type I markings only),
- using widths and colors shown on the plans,
- at locations shown on the plans,
- in proper alignment with the guides without deviating from the alignment more than 1 in. per 200 ft. of roadway or more than 2 in. maximum,
- without abrupt deviations,
- free of blisters and with no more than 5% by area of holes or voids,
- with uniform cross-section, density and thickness,
- with clean and reasonably square ends,
- that are retroreflectorized with drop-on glass beads, and
- using personnel skilled and experienced with installation of pavement markings.

Remove all applied markings that are not in alignment or sequence as stated on the plans, or in the specifications, at the Contractor's expense in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers," except for measurement and payment.

- 4.2. **Surface Preparation.** Prepare surfaces in accordance with this Section unless otherwise shown on the plans.
- 4.2.1. **Cleaning for New Asphalt Surfaces and Retracing of All Surfaces.** Air blast or broom the pavement surface for new asphalt surfaces (less than 3 years old) and for retracing of all surfaces to remove loose material, unless otherwise shown on the plans. A sealer for Type I markings is not required unless otherwise shown on the plans.
- 4.2.2. **Cleaning for Old Asphalt and Concrete Surfaces (Excludes Retracing).** Clean old asphalt surfaces (more than 3 years old) and all concrete surfaces in accordance with Item 678, "Pavement Surface Preparation for Markings," to remove curing membrane, dirt, grease, loose and flaking existing construction markings, and other forms of contamination.
- 4.2.3. **Sealer for Type I Markings.** Apply a pavement sealer to old asphalt surfaces (more than 3 years old) and to all concrete surfaces before placing Type I markings on locations that do not have existing markings, unless otherwise approved. The pavement sealer may be either a Type II marking or an acrylic or epoxy sealer as recommended by the Type I marking manufacturer unless otherwise shown on the plans. Follow the manufacturer's directions for application of acrylic or epoxy sealers. Clean sealer that becomes dirty after placement by washing or in accordance with Section 666.4.2.1., "Cleaning for New Asphalt Surfaces and Retracing of All Surfaces," as directed. Place the sealer in the same configuration and color (unless clear) as the Type I markings unless otherwise shown on the plans.
- 4.3. **Application.** Apply markings during good weather unless otherwise directed. If markings are placed at Contractor option when inclement weather is impending and the markings are damaged by subsequent precipitation, the Contractor is responsible for all required replacement costs.
- 4.3.1. **Type I Markings.** Place the Type I marking after the sealer cures. Apply within the temperature limits recommended by the material manufacturer. Flush the spray head if spray application operations cease for 5 min or longer by spraying marking material into a pan or similar container until the material being applied is at the recommended temperature.

Apply on clean, dry pavements passing the moisture test described in Section 666.4.1., "General," and with a surface temperature above 50°F when measured in accordance with Tex-829-B.

- 4.3.1.1. **Non-Profile Pavement Markings.** Apply Type I non-profile markings with a minimum thickness of:
- 0.100 in. (100 mils) for new markings and retracing water-based markings on surface treatments involving Item 316, "Seal Coat,"
  - 0.060 in. (60 mils) for retracing on thermoplastic pavement markings, or
  - 0.090 in. (90 mils) for all other Type I markings.

The maximum thickness for Type I non-profile markings is 0.180 in. (180 mils). Measure thickness for markings in accordance with Tex-854-B using the tape method.

- 4.3.1.2. **Profile Pavement Markings.** Apply Type I profile markings with a minimum thickness of:
- 0.060 in. (60 mil) for edgeline markings, or
  - 0.090 in. (90 mil) for gore and centerline/no-passing barrier line markings.

In addition, at a longitudinal spacing indicated on the plans, the markings must be profiled in a vertical manner such that the profile is transverse to the longitudinal marking direction. The profile must not be less than 0.30 in. (300 mil) nor greater than 0.50 in. (500 mil) in height when measured above the normal top surface plane of the roadway. The transverse width of the profile must not be less than 3.25 in., and the longitudinal width not less than 1 in., when measured at the top surface plane of the profile bar. The profile may be either a 1 or 2 transverse bar profile. When the 2 transverse bar profile is used, the spacing between the bases of the profile bars must not exceed 0.50 in. The above transverse bar width is for each 4 in. of line width.

- 4.3.2. **Type II Markings.** Apply on surfaces with a minimum surface temperature of 50°F. Apply at least 20 gal. per mile on concrete and asphalt surfaces and at least 22 gal. per mile on surface treatments for a solid 4-in. line. Adjust application rates proportionally for other widths. When Type II markings are used as a sealer for Type I markings, apply at least 15 gal. per mile using Type II drop-on beads.

- 4.3.3. **Bead Coverage.** Provide a uniform distribution of beads across the surface of the stripe for Type I and Type II markings, with 40% to 60% bead embedment.

- 4.4. **Retroreflectivity Requirements.** When specified on the plans, Type I markings must meet the following minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application:

- White markings: 250 millicandelas per square meter per lux (mcd/m<sup>2</sup>/lx)
- Yellow markings: 175 mcd/m<sup>2</sup>/lx

- 4.5. **Retroreflectivity Measurements.** Use a mobile retroreflectometer for projects requiring minimum retroreflectivity requirements to measure retroreflectivity for Contracts totaling more than 200,000 ft. of pavement markings, unless otherwise shown on the plans. For Contracts with less than 200,000 ft. of pavement markings or Contracts with callout work, mobile or portable retroreflectometers may be used at the Contractor's discretion.

- 4.5.1. **Mobile Retroreflectometer Measurements.** Provide mobile measurements averages for every 0.1 miles unless otherwise specified or approved. Take measurements on each section of roadway for each series of markings (i.e., edgeline, center skip line, each line of a double line, etc.) and for each direction of traffic flow. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). Furnish measurements in compliance with Special Specification, "Mobile Retroreflectivity Data Collection for Pavement Markings," unless otherwise approved. The Engineer may require an occasional field comparison check with a portable retroreflectometer meeting the requirements listed above to ensure accuracy. Use all equipment in accordance with the manufacturer's recommendations and directions. Inform the Engineer at least 24 hr. before taking any measurements.

A marking meets the retroreflectivity requirements if:

- the combined average retroreflectivity measurement for a one-mile segment meets the minimum retroreflectivity values specified, and
- no more than 30% of the retroreflectivity measurement values are below the minimum retroreflectivity requirements value within the one-mile segment.

The Engineer may accept failing one-mile segments if no more than 20% of the retroreflectivity measurements within that mile segment are below the minimum retroreflectivity requirement value.

The one-mile segment will start from the beginning of the data collection and end after a mile worth of measurements have been taken; each subsequent mile of measurements will be a new segment. Centerlines with 2 stripes (either solid or broken) will result in 2 miles of data for each mile segment. Each centerline stripe must be tested for compliance as a stand-alone stripe.

Restripe at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking if the marking fails retroreflectivity requirements. Take measurements every 0.1 miles a minimum of 10 days after this second application within that mile segment for that series of markings.

If the markings do not meet minimum retroreflectivity after 10 days of this second application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

- 4.5.2. **Portable Retroreflectometer Measurements.** Take a minimum of 20 measurements for each 1-mi. section of roadway for each series of markings (i.e., edgeline, center skip line, each line of a double line, etc.) and direction of traffic flow when using a portable reflectometer. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). The spacing between each measurement must be at least 100 ft. The Engineer may decrease the mileage frequency for measurements if the previous measurements provide satisfactory results. The Engineer may require the original number of measurements if concerns arise.

Restripe once at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements fails. Take a minimum of 10 more measurements after 10 days of this second application within that mile segment for that series of markings. Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements fall below the minimum retroreflectivity requirements. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

- 4.5.3. **Traffic Control.** Provide traffic control, as required, when taking retroreflectivity measurements after marking application. On low volume roadways (as defined on the plans), refer to the figure, "Temporary Road Closure" in Part 6 of the *Texas Manual on Uniform Traffic Control Devices* for the minimum traffic control requirements. For all other roadways, the minimum traffic control requirements will be as shown on the Traffic Control Plan (TCP) standard sheets TCP (3-1) and TCP (3-2). The lead vehicle will not be required on divided highways. The TCP and traffic control devices must meet the requirements listed in Item 502, "Barricades, Signs, and Traffic Handling." Time restrictions that apply during striping application will also apply during the retroreflectivity inspections except when using the mobile retroreflectometer unless otherwise shown on the plans or approved.

- 4.6. **Performance Period.** All markings must meet the requirements of this specification for at least 30 calendar days after installation. Unless otherwise directed, remove pavement markings that fail to meet requirements, and replace at the Contractor's expense. Replace failing markings within 30 days of notification. All replacement markings must also meet all requirements of this Item for a minimum of 30 calendar days after installation.

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**5. MEASUREMENT**

This Item will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans. Each stripe will be measured separately.

This is a plans quantity measurement item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Acrylic or epoxy sealer, or Type II markings when used as a sealer for Type I markings, will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans.

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**6. PAYMENT**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Sealer" of the size specified, "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size, and thickness specified as applicable, "Retroreflectorized Pavement Markings with Retroreflective Requirements" of the types, colors, sizes, widths, and thicknesses specified or "Retroreflectorized Profile Pavement Markings" of the various types, colors, shapes, sizes, and widths specified.

This price is full compensation for application of pavement markings, materials, equipment, labor, tools, and incidentals.

Surface preparation of new concrete and asphalt concrete pavements more than 3 years old, where no stripe exists, will be paid for under Item 678, "Pavement Surface Preparation for Markings." Surface preparation of all other asphalt and old concrete pavement, except for sealing, will not be paid for directly but is subsidiary to this Item.

Work-zone pavement markings (Type II, paint and beads) used as a sealer for Type I markings (thermoplastic) will be paid for under Item 662, "Work Zone Pavement Markings."

If the Engineer requires that markings be placed in inclement weather, repair or replacement of markings damaged by the inclement weather will be paid for in addition to the original plans quantity.



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## Special Provision to Item 666

### Retroreflectorized Pavement Markings

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For this project, Item 666, "Retroreflectorized Pavement Markings," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

**Article 666.4., "Construction,"** is supplemented by the following:

**666.4.3.2.1. Retroreflectorized Type II Pavement Markings Patch.** Unless otherwise directed in the General Notes and Specification Data, a patch will be defined as continuous pavement maintenance work of 1,000 LF or less along the center line of the roadway. Striping of patches may consist of centerline markings and edge lines.

The Engineer will determine if the entire roadway or patch areas are striped.

Contractor will remove temporary work zone pavement markings (tabs or temporary tape) prior to placement of permanent markings. Tabs may be cut.

**Article 666.6., "Payment,"** the first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for "Pavement Sealer" of the size specified or "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size and thickness (Type I markings only) specified as applicable or "Retroreflectorized Pavement Marking (Patch)" of the shape, width, size and thickness (Type II markings only) specified as applicable. This price will be full compensation for materials, application of pavement markings, equipment, labor, tools and incidentals necessary to complete the work specified.

## Special Provision to Item 666

### Retroreflectorized Pavement Markings



For this project, Item 666, "Retroreflectorized Pavement Markings," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

**Article 666.4., "Construction,"** is supplemented by the following:

**666.4.3.4. Retroreflectorized Pavement Markings Callout.** Perform work at locations not shown on the plans on a callout basis. The minimum quantity on the callout will not be less than 3,000 linear feet per roadway per work order.

**Article 666.5., "Measurement,"** is voided and replaced by the following:

**666.5.1. Reflectorized Pavement Markings.** This Item will be measured by the foot; by each word, symbol, shape; or by any other unit shown on the plans. Each stripe will be measured separately.

**666.5.2. Reflectorized Pavement Markings Callout.** This Item will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans. Each stripe will be measured separately.

**666.5.3. Acrylic or Epoxy Sealer.** Acrylic or epoxy sealer, or Type II markings when used as a sealer for Type I markings, will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

**Article 666.6., "Payment,"** the first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for "Pavement Sealer" of the size specified or "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size and thickness (Type I markings only) specified as applicable or "Retroreflectorized Pavement Marking Callout" of the shape, width, size and thickness (Type I markings only) specified as applicable.

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## Special Provision to Item 666

### Reflectorized Pavement Markings with Retroreflective Requirements

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For this project, Standard Specification Item 666, "Reflectorized Pavement Markings" is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived and changed hereby.

**Section 666.4.4., "Retroreflectivity Measurements."** is supplemented by the following:

When specified on the plans, Type II markings must meet the following minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application:

- White markings: 175 mcd/m<sup>2</sup>/lx
- Yellow markings: 100 mcd/m<sup>2</sup>/lx

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## Special Provision to Item 666

### Retroreflectorized Pavement Markings

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Item 666, "Retroreflectorized Pavement Markings" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 4., "Construction,"** is supplemented by the following:

**4.3.1.3., "Retroreflectorized Type I Pavement Markings Spot Striping."** Perform Spot Striping on a callout basis with a minimum callout quantity of 7,500 ft. per callout.

**4.3.2.1., "Retroreflectorized Type II Pavement Markings Spot Striping."** Perform Spot Striping on a callout basis with a minimum callout quantity of 7,500 ft. per callout.

**Article 6. "Payment."** The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Sealer" of the size specified, "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size, and thickness (Type I markings only) specified as applicable, "Retroreflectorized Pavement Markings with Retroreflective Requirements" of the types, colors, sizes, widths, and thicknesses specified, "Retroreflectorized Profile Pavement Markings" of the various types, colors, shapes, sizes and widths specified or "ReflectORIZED Pavement Marking (Call Out)" of the shape, width, size and thickness (Type I markings only) specified as applicable or Pavement Sealer (Call Out) of the size specified. This price is full compensation for materials, application of pavement markings, equipment, labor, tools, and incidentals.

## Special Provision to Item 666

### Retroreflectorized Pavement Markings



Item 666, "Retroreflectorized Pavement Markings" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Article 4., "Materials,"** is supplemented by the following:

**4.3.1.3., "Retroreflectorized Type I Pavement Markings Spot Striping."** Perform Spot Striping on a callout basis with a minimum callout quantity as shown in the plans.

**4.3.2.1., "Retroreflectorized Type II Pavement Markings Spot Striping."** Perform Spot Striping on a callout basis with a minimum callout quantity as shown in the plans.

**Section 4.2.3., "Glass Traffic Beads."** The first paragraph is voided and replaced by the following:

Furnish drop-on glass beads in accordance with DMS-8290, "Glass Traffic Beads" or as approved. Furnish a double-drop of Type II and Type III drop-on glass beads for longitudinal pavement markings where each type bead is applied separately in equal portions (by weight), unless otherwise approved. Apply the Type III beads before applying the Type II beads. Furnish Type II beads for work zone pavement markings and transverse markings or symbols.

**Section 4.4., "Retroreflectivity Requirements,"** is voided and replaced by the following:

Type I markings for Contracts totaling more than 200,000 ft. of pavement markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline or no passing barrier-line, and lane line markings when measured any time after 3 days, but not later than 10 days after application:

- White markings: 250 millicandelas per square meter per lux (mcd/m<sup>2</sup>/lx)
- Yellow markings: 175 mcd/m<sup>2</sup>/lx

Retroreflectivity requirements for Type I markings are not required for Contracts with less than 200,000 ft. of pavement markings or Contracts with callout work, unless otherwise shown on the plans.

**Section 4.5., "Retroreflectivity Measurements,"** is voided and replaced by the following:

Use a mobile retroreflectorimeter to measure retroreflectivity for Contracts totaling more than 200,000 ft. of pavement markings, unless otherwise shown on the plans. For Contracts with less than 200,000 ft. of pavement markings mobile or portable retroreflectorimeters may be used at the Contractor's discretion when retroreflectivity is specified on the plans. Coordinate with and obtain authorization from the Engineer before starting any retroreflectivity data collection.

**Section 4.5.1., Mobile Retroreflectorimeter Measurements.** The last two paragraphs are voided and replaced by the following:

Restripe at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking if the marking fails retroreflectivity requirements. Take measurements every 0.1 miles a minimum of 10 days after this second application within that mile segment for that series of markings.

Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements fall below the minimum retroreflectivity requirements. If the markings do not meet minimum retroreflectivity

after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

**Section 4.5.2., "Portable Retroreflector Measurements."** The first and second paragraphs are voided and replaced by the following:

Provide portable measurement averages for every 1.0 mile unless otherwise specified or approved. Take a minimum of 20 measurements for each 1-mi. section of roadway for each series of markings (i.e., edgeline, center skip line, each line of a double line, etc.) and direction of traffic flow when using a portable reflectometer. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). The spacing between each measurement must be at least 100 ft. The Engineer may decrease the mileage frequency for measurements if the previous measurements provide satisfactory results. The Engineer may require the original number of measurements if concerns arise.

Restripe at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the averages of these measurements fail. Take a minimum of 10 more measurements after 10 days of this second application within that mile segment for that series of markings. Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the averages of these measurements fall below the minimum retroreflectivity requirements. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

**Article 6. "Payment."** The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Sealer" of the size specified, "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size, and thickness (Type I markings only) specified as applicable, "Retroreflectorized Pavement Markings with Retroreflective Requirements" of the types, colors, sizes, widths, and thicknesses specified, "Retroreflectorized Profile Pavement Markings" of the various types, colors, shapes, sizes and widths specified or "Reflectorized Pavement Marking (Call Out)" of the shape, width, size and thickness (Type I markings only) specified as applicable or Pavement Sealer (Call Out) of the size specified. This price is full compensation for materials, application of pavement markings, equipment, labor, tools, and incidentals.

## Special Provision to Item 666

### Retroreflectorized Pavement Markings



Item 666, "Retroreflectorized Pavement Markings," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

**Section 2.3., "Glass Traffic Beads."** The first paragraph is voided and replaced by the following:

Furnish drop-on glass beads in accordance with DMS-8290, "Glass Traffic Beads," or as approved. Furnish a double-drop of Type II and Type III drop-on glass beads for longitudinal pavement markings where each type bead is applied separately in equal portions (by weight), unless otherwise approved. Apply the Type III beads before applying the Type II beads. Furnish Type II beads for work zone pavement markings and transverse markings or symbols.

**Section 4.3.1., "Type I Markings,,"** is supplemented by the following:

**4.3.1.3. Spot Striping.** Perform spot striping on a callout basis with a minimum callout quantity as shown on the plans.

**Section 4.3.2., "Type II Markings,,"** is supplemented by the following:

**4.3.2.1. Spot Striping.** Perform spot striping on a callout basis with a minimum callout quantity as shown on the plans.

**Section 4.4., "Retroreflectivity Requirements,,"** is voided and replaced by the following.

Type I markings for Contracts totaling more than 20,000 ft. of pavement markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline or no passing barrier-line, and lane line markings when measured any time after 3 days, but not later than 10 days after application.

- White markings: 250 millicandelas per square meter per lux (mcd/m<sup>2</sup>/lx)
- Yellow markings: 175 mcd/m<sup>2</sup>/lx

Retroreflectivity requirements for Type I markings are not required for Contracts with less than 20,000 ft. of pavement markings or Contracts with callout work, unless otherwise shown on the plans.

**Section 4.5., "Retroreflectivity Measurements,,"** is voided and replaced by the following:

Use a mobile retroreflectometer to measure retroreflectivity for Contracts totaling more than 50,000 ft. of pavement markings, unless otherwise shown on the plans. For Contracts with less than 50,000 ft. of pavement markings, mobile or portable retroreflectometers may be used at the Contractor's discretion. Coordinate with and obtain authorization from the Engineer before starting any retroreflectivity data collection.

**Section 4.5.1., "Mobile Retroreflectometer Measurements."** The last paragraph is voided and replaced by the following.

Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements falls below the minimum retroreflectivity requirements. Take measurements every 0.1 miles a minimum of 10 days after this third application within that mile segment for that series of markings. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

**Section 4.5.2., "Portable Retroreflector Measurements."** The first and second paragraphs are voided and replaced by the following.

Provide portable measurement averages for every 1.0 mile unless otherwise specified or approved. Take a minimum of 20 measurements for each 1-mi. section of roadway for each series of markings (e.g., edgeline, center skip line, each line of a double line) and direction of traffic flow when using a portable reflectometer. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). The spacing between each measurement must be at least 100 ft. The Engineer may decrease the mileage frequency for measurements if the previous measurements provide satisfactory results. The Engineer may require the original number of measurements if concerns arise.

Restripe at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the averages of these measurements fail. Take a minimum of 10 more measurements after 10 days of this second application within that mile segment for that series of markings. Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements falls below the minimum retroreflectivity requirements. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

**Section 4.6. "Performance Period."** The first sentence is voided and replaced by the following:

All longitudinal markings must meet the minimum retroreflectivity requirements within the time frame specified. All markings must meet all other performance requirements of this specification for at least 30 calendar days after installation.

**Article 6. "Payment."** The first two paragraphs are voided and replaced by the following.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Sealer" of the size specified; "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size, and thickness (Type I markings only) specified, as applicable; "Retroreflectorized Pavement Markings with Retroreflective Requirements" of the types, colors, sizes, widths, and thicknesses specified; "Retroreflectorized Profile Pavement Markings" of the various types, colors, shapes, sizes, and widths specified; or "Reflectorized Pavement Marking (Call Out)" of the shape, width, size, and thickness (Type I markings only) specified, as applicable; or "Pavement Sealer (Call Out)" of the size specified.

This price is full compensation for materials, application of pavement markings, equipment, labor, tools, and incidentals.



## Item 672

### Raised Pavement Markers



#### 1. DESCRIPTION

Furnish and install raised pavement markers (RPMs).

#### 2. MATERIALS

2.1. **Markers.** Furnish RPMs in accordance with the following Department Material Specifications:

- **Reflectorized Pavement Markers.** DMS-4200, "Pavement Markers (Reflectorized)," types I-A, I-C, I-R, II-A-A, and II-C- R.
- **Traffic Buttons.** DMS-4300, "Traffic Buttons," types I-A, I-C, I-R, II-A-A, II-C- R, W, Y and B. Round or oval unless otherwise specified on the plans.
- **Plowable Reflectorized Pavement Markers.** DMS-4210, "Snowplowable Pavement Markers," types I-A, I-C, I-R, II-A-A, and II-C- R.

The following are descriptions for each type of RPM:

- **Type I-A.** The approach face must retro-reflect amber light. The body, other than the retro-reflective face, must be yellow.
- **Type I-C.** The approach face must retro-reflect white light. The body, other than the retro-reflective face, must be white or silver-white.
- **Type I-R.** The trailing face must retro-reflect red light. The body, other than the retro-reflective face, must be white or silver-white, except for I-R plowable markers which may be black.
- **Type II-A-A.** The 2 retro-reflective faces (approach and trailing) must retro-reflect amber light. The body, other than the retro-reflective faces, must be yellow.
- **Type II-C-R.** Contain 2 retro-reflective faces with an approach face that must retro-reflect white light and a trailing face that must retro-reflect red light. The body, other than the retro-reflective faces, must be white or silver-white.
- **Type W.** Must have a white body and no reflective faces.
- **Type Y.** Must have a yellow body and no reflective faces.
- **Type B.** Must have a black body and no reflective faces.

2.2. **Adhesives.** Furnish adhesives that conform to the following requirements:

- DMS-6100, "Epoxy and Adhesives," Type II—Traffic Marker Adhesives.
- DMS-6130, "Bituminous Adhesive for Pavement Markers."
- The Contractor may propose alternate adhesive materials for consideration and approval.

2.3. **Sampling.** The Engineer will sample in accordance with Tex-729-I.

#### 3. CONSTRUCTION

Remove existing RPMs in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers" (except for measurement and payment). Furnish RPMs for each class from the same manufacturer. Prepare all surfaces in accordance with Item 678, "Pavement Surface Preparation for Markings," when shown on the plans. Ensure the bond surfaces are free of dirt, curing compound, grease, oil, moisture, loose or unsound pavement markings, and any other material that would adversely affect the adhesive bond.

Establish pavement marking guides to mark the lateral location of RPMs as shown on the plans and as directed. Do not make permanent marks on the roadway for the guides.

Place RPMs in proper alignment with the guides. Acceptable placement deviations are shown on the plans.

Remove RPMs placed out of alignment or sequence, as shown on the plans or stated in this specification, at Contractor's expense, in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers" (except for measurement and payment).

Use the following adhesive materials for placement of reflectorized pavement markers, and traffic buttons unless otherwise shown on the plans:

- standard or flexible bituminous adhesive for applications on bituminous pavements, and
- epoxy adhesive or flexible bituminous adhesive for applications on hydraulic cement concrete pavements.

Use epoxy adhesive for plowable reflectorized pavement markers.

Apply enough adhesives to:

- ensure that 100% of the bonding area of RPMs is in contact with the adhesive, and
- ensure that RPMs, except for plowable markers, are seated on a continuous layer of adhesive and not in contact with the pavement surface.

Apply adhesives in accordance with manufacturer's recommendations unless otherwise required by this Article. Apply bituminous adhesive only when pavement temperature and RPM temperature are 40°F or higher. Do not heat bituminous adhesive above 400°F. Machine agitate bituminous adhesive continuously before application to ensure even heat distribution.

Machine-mix epoxy adhesive. Apply epoxy adhesive only when pavement temperature is 50°F or higher.

Furnish RPMs free of rust, scale, dirt, oil, grease, moisture, and contaminants that might adversely affect the adhesive bond.

Place RPMs immediately after the adhesive is applied and ensure proper bonding. Do not use adhesives or any other material that impairs the functional retro-reflectivity of the RPMs.

Provide a 30-day performance period that begins the day following written acceptance for each separate location. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations. This written acceptance does not constitute final acceptance.

Replace all missing, broken or non-reflective RPMs. Visual evaluations will be used for these determinations. Upon request, the Engineer will allow a Contractor representative to accompany the Engineer on these evaluations.

The Engineer may exclude RPMs from the replacement provisions of the performance, provided the Engineer determines the failure is a result of causes other than defective material or inadequate installation procedures. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and pavement failure.

Replace all missing or non-reflective RPMs identified during the performance period within 30 days after notification. The end of the performance period does not relieve the Contractor from the performance deficiencies requiring corrective action identified during the performance period.

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**4. MEASUREMENT**

This item will be measured by each RPM.

This is a plans quantity measurement item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments are required.

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**5. PAYMENT**

The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Reflectorized Pavement Marker," "Traffic Button," or "Plowable Reflectorized Pavement Marker" of the types specified. This price is full compensation for removing existing markers; furnishing and installing RPMs; and materials, equipment, labor, tools, and incidentals.

No additional payment will be made for replacement of RPMs failing to meet the performance requirements.

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## Special Provision to Item 672

### Raised Pavement Markings

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For this project, Item 672, "Raised Pavement Markings," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

**Article 672.3., "Construction,"** the twelfth paragraph is voided and replaced by the following:

Provide a 30-day performance period that begins the day following written acceptance for each separate location or patch. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations. This written acceptance does not constitute final acceptance.

**Article 672.3., "Construction,"** is supplemented by the following:

**672.3.1. Raised Pavement Markers Patch.** Raised Pavement Markers will be in accordance with Item 672, "Raised Pavement Markers." Unless otherwise directed in the General Notes and Specification Data, a patch will be defined as 1,000 LF or less along the center line of the roadway. The Engineer will determine whether to remove and place markers on the entire roadway segment or just the patch areas. Unless otherwise directed on the plans, the Contractor will remove temporary pavement markings (tabs or temporary tape) prior to placement of permanent markers.

**Article 672.5., "Payment,"** the first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for "Reflectorized Pavement Marker," "Traffic Button," "Plowable Reflectorized Pavement Marker," or "Reflectorized Pavement Marker (Patch)" of the types specified.

## RPMs INSTALLATION RECORD

The 30-day performance period begins the day after written acceptance for each separate location. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations.

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Contractor signature

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Date

Department signature

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Date \_\_\_\_\_

## Item 677

### Eliminating Existing Pavement Markings and Markers



#### 1. DESCRIPTION

Eliminate existing pavement markings and raised pavement markers (RPMs).

#### 2. MATERIALS

Furnish surface treatment materials in accordance with the following Items:

- Item 300, "Asphalts, Oils, and Emulsions"
- Item 302, "Aggregates for Surface Treatments"
- Item 316, "Seal Coat"

Use approved patching materials for repairing damaged surfaces.

Use a commercial abrasive blasting medium capable of producing the specified surface cleanliness. Use potable water when water is required.

#### 3. EQUIPMENT

Furnish and maintain equipment in good working condition. Use moisture and oil traps in air compression equipment to remove all contaminants from the blasting air and prevent the deposition of moisture, oil, or other contaminants on the roadway surface.

#### 4. CONSTRUCTION

Eliminate existing pavement markings and markers on both concrete and asphaltic surfaces in such a manner that color and texture contrast of the pavement surface will be held to a minimum. Remove all markings and markers with minimal damage to the roadway to the satisfaction of the Engineer. Repair damage to asphaltic surfaces, such as spalling, shelling, etc., greater than 1/4 in. deep resulting from the removal of pavement markings and markers. Dispose of markers in accordance with federal, state, and local regulations. Use any of the following methods unless otherwise shown on the plans:

- 4.1. **Surface Treatment Method.** Apply surface treatment material at rates shown on the plans, or as directed. Place a surface treatment a minimum of 2 ft. wide to cover the existing marking. Place a surface treatment, thin overlay, or microsurfacing a minimum of one lane in width in areas where directional changes of traffic are involved or other areas as directed.
- 4.2. **Burn Method.** Use an approved burning method. For thermoplastic pavement markings or prefabricated pavement markings, heat may be applied to remove the bulk of the marking material before blast cleaning. When using heat, avoid spalling pavement surfaces. Sweeping or light blast cleaning may be used to remove minor residue.
- 4.3. **Blasting Method.** Use a blasting method such as water blasting, abrasive blasting, water abrasive blasting, shot blasting, slurry blasting, water-injected abrasive blasting, or brush blasting as approved. Remove pavement markings on concrete surfaces by a blasting method only.
- 4.4. **Mechanical Method.** Use any mechanical method except grinding. Flail milling is acceptable in the removal of markings on asphalt and concrete surfaces.

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**5. MEASUREMENT**

This item will be measured by each word, symbol, or shape eliminated; by the foot of marking eliminated; or by any other unit shown on the plans.

This is a plans quantity measurement item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

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**6. PAYMENT**

The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Eliminating Existing Pavement Markings and Markers" of the type and width as applicable. This price is full compensation for the elimination method used and materials, equipment, tools, labor, and incidentals. Removal of RPMs will not be paid for directly but will be subsidiary to the pertinent bid items.

