

STATE OF TEXAS
COUNTY OF BELL

THIS AGREEMENT, made and entered into this ___ day of _____, 20___, by and between the City of Killeen, a municipal corporation, organized and existing under laws of the State of Texas, acting through its City Manager or other duly authorized designee, hereinafter referred to as the "Owner." and Green Dream International, of the City of Erie, Counties of Erie, and the State of Pennsylvania, hereinafter referred to as the "CONTRACTOR."

WITNESSETH: That for and in consideration of the promises, performances, payments, and agreements hereinafter mentioned, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

Bid # 22-02 Pavement Marking Services and all Work in accordance with the, Invitation to Bid and Addenda (if applicable), which are incorporated herein by reference and made a part hereof and which have been prepared by the **City of Killeen** and approved by OWNER, and OWNER agrees to pay the CONTRACTOR for the following:

Line items per outlined attached bid tabulation based upon estimated quantities

Per referenced Bid # 22-02, Pavement Marking Services - Specifications

ITEM	BID PRICE
REFL PAV MRK TY I (W)8"(DOT)(090MIL)	\$2.56 LF
REFL PAV MRK TY I (W)8"(SLD)(090MIL)	\$1.04 LF
REFL PAV MRK TY I (W)12"(SLD)(090MIL)	\$3.59 LF
REFL PAV MRK TY I (W)24"(SLD)(090MIL)	\$7.88 LF
REFL PAV MRK TY I (W)(ARROW)(090MIL)	\$165.92 EA
REFL PAV MRK TY I(W)(DBL ARROW)(090MIL)	\$202.69 EA
REFL PAV MRK TY I (W)(WORD)(090MIL)	\$197.98 EA
REFL PAV MRK TY I (W)(RR XING)(090MIL)	\$790.56 EA
REF PAV MRK TY I(W)18"(YLD TRI)(090MIL)	\$33.92 EA
REFL PAV MRK TY I(W)(BIKE SYML)(090MIL)	\$205.42 EA
REFL PAV MRK TY I (Y)12"(SLD)(090MIL)	\$4.15 LF
REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	\$0.89 LF
REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	\$1.18 LF
RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)	\$0.43 LF
REFL PAV MRKR TY I-C	\$5.17 EA
REFL PAV MRKR TY II-A-A	\$4.10 EA
ELIM EXT PAV MRK & MRKS (4")	\$0.49 LF
ELIM EXT PAV MRK & MRKS (8")	\$1.00 LF
ELIM EXT PAV MRK & MRKS (12")	\$1.98 LF
ELIM EXT PAV MRK & MRKS (24")	\$4.26 LF
ELIM EXT PAV MRK & MRKS (ARROW)	\$148.93 EA
ELIM EXT PAV MRK & MRKS (DBL ARROW)	\$268.40 EA
ELIM EXT PAV MRK & MRKS (WORD)	\$141.32 EA
ELIM EXT PAV MRK & MRKS (RR XING)	\$206.42 EA
ELIM EXT PAV MRK & MRKS (18")(YLD TRI)	\$35.81 EA
ELIM EXT PAV MRK & MARKS (BIKE SYMBOL)	\$7.50 LF

Term of Contract and Option to Extend:

Any contract resulting from this ITB shall be effective for two (2) years upon execution by the City of Killeen. The City anticipates that contract shall be renewed pursuant to the availability of funds and at the discretion of the City. The following clauses shall be included in the contract:

- A. **Option Clause:** It is agreed that the City will have the option to extend the contract for up to two (2) additional years, in six (6) month intervals. This option will occur automatically at the end of the previous term unless the City / Contractor serve notice 60 days prior to contract termination or the end of any extension period. The option to extend will not be considered if funding is unavailable or if the contractor's past performance is not within the industry standard.
- B. **Escalation Clause:** 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 contract or after extension renewal and only upon securing the approval of the City in writing. Requests for price adjustments must be solely for the purpose of accommodating an increase in the contractor's cost, not profits.

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 any pricing adjustments.

Pricing & Term Renewals:

- A. Pricing shall reflect the full Scope defined herein, inclusive of all associated cost for delivery, labor, insurance, taxes, overhead, and profit.
- B. Bidder shall quote unit pricing in accordance with the itemized listing of products or contracts segments using the following format.

Any request in price change with supporting documentation shall be sent to only:

**City of Killeen
Attn: Purchasing Division
802 N. 2nd Street
Building E, 2nd Floor, Rm #215
Killeen TX 76541**

On the envelope place "Price Change Notification Bid No. 22-02"

If during any term of this contract, the bidder should enter into any contract with another municipality within Texas for commodities or services with similar scope of work with rates more favorable than those granted to the City of Killeen, the bidder agrees to modify this contract to include such more favorable rates. It is recommended that the bidder provide any rate reduction or discount voluntarily.

Community Development Block Grant (CDBG)

Projects may be funded in whole or in part by the U.S. Department of Housing and Urban Development Community Development Block Grant (CDBG) or Home Investment Partnerships Act (HOME Program) and may be subject to submittal of certified payroll documentation as required by HUD 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.

Acknowledgement – "Boycott Israel"

By signing and submitting this bid the vendor hereby verifies that it does not boycott Israel and will not boycott Israel during the term of this contract. Boycotting Israel is defined in Texas Government Code section 808.001 to mean refusing to deal with, terminating business activities with, or taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

Acknowledgement – ‘Boycott Energy Companies’

By signing and submitting this bid the vendor hereby verifies 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 Texas Government Code section 809.001 to mean, without an ordinary business purpose, refusing to deal with terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (A) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (B) does business with a company described by Paragraph (A).

Acknowledgement – “Prohibition on contracts with companies that discriminate against firearm and ammunition industries”

By signing and submitting this bid the vendor hereby verifies 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. Discriminate against a firearm entity or a firearm trade association are defined in Texas Government Code section 2274.001 as (A) with respect to the entity or association, to (i) refuse to engage in the trade of any goods or services; (ii) refrain from continuing an existing business relationship; (iii) terminate an existing business relationship; or (iv) otherwise express a prejudice against the entity or association; and (B) does not include the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories.

Cooperative Governmental Purchasing Notice

Other governmental entities maintaining interlocal agreements with the City, may desire, but are not obligated, to purchase goods and services defined in this ITB from the successful Bidder. All purchases by governmental entities, other than the City, will be billed directly to and paid by that governmental entity. The City will not be responsible for another governmental entity's debts. Each governmental entity will place their own orders with the successful Bidder and be responsible for ensuring full compliance with the ITB specifications. Prior to other governmental entities placing orders, the City will notify the successful Bidder of their intent.

Please indicate below if you will permit other governmental entities to purchase from your agreement with the City.

Yes, Others can purchase **No, Only the City can purchase.**

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

Contractor hereby agrees to abide by all requirements signed in Bid # 22-02

Waiver of any breach of the Contract shall not constitute waiver of any subsequent breach.

OWNER agrees to pay CONTRACTOR from available funds for performance of the Contract in accordance with the Bid and the provisions of the Contract Documents, subject to additions and deductions, as provided therein.

The OWNER's payment obligations are payable only and solely from funds available for the purposes of this Agreement.

Although drafted by the OWNER, this Agreement, in event of any disputes over its meaning or application, shall be interpreted fairly and reasonably, and neither more strongly for nor against either party.

OWNER

By: _____
City of Killeen

Date

City Manager

Title of Signatory

By: _____
City Attorney

Date

CONTRACTOR

By: _____
Green Dream International

Date

Printed Name of Signatory

Title of Signatory, Authorized Representative

ATTEST (as applicable)

ATTACHMENTS

- Christmas Eve
- Christmas Day

Deliveries shall be made to any City of Killeen location. Delivery can be scheduled Monday through Friday between the hours of 5:00 a.m. and 6:00 p.m. The City shall have the ability to schedule the best date and time of the week for their deliveries. For questions and / or assistance Monday through Friday between the hours of 7:00 a.m. and 4:00 p.m., contact Transportation at 254-616-3153.

Emergency Business Service Contact Notice

During a natural disaster, or homeland security event, there may be a need for the City of Killeen to access your business for products or services after normal business hours and/or holidays. The City may request City employee pick up or vendor delivery of product or services.

For this purpose, a primary and secondary emergency contact name and phone number are required. It is critical the vendor's emergency contact information remains current. City shall be contacted by E-mail with any change to a contact name or phone number of these emergency contacts. Updates may be emailed to lluciano@killeentexas.gov.

All products or services requested during an emergency event are to be supplied as per the established contract prices, terms and conditions. The vendor shall provide the fee (pricing) for an after-hours emergency opening of the business, if any. In general, orders will be placed using a City of Killeen procurement card (Master Card) or City issued Purchase Order. The billing is to include the emergency opening fee, if applicable.

The contractor shall provide the names, phone numbers and fee (pricing), if any, for an after hour's emergency opening of the business listed below.

Business Name: Green Dream International LLC

Contract #: Bid #22-02

Description: Pavement Marking Services

Primary Contact (Name): Varand Vartanian

Primary Contact Phone Numbers: Home: 814-616-7800 Cell:

Secondary Contact (Name): Ben Fischer

Secondary Contact Phone Numbers: Home: 814-840-1880 Ext: 111 Cell:

After Hours emergency opening fee, if applicable: \$ N/A

Cooperative Governmental Purchasing Notice

Other governmental entities maintaining interlocal agreements with the City, may desire, but are not obligated, to purchase goods and services defined in this ITB from the successful Bidder. All purchases by governmental entities, other than the City, will be billed directly to and paid by that governmental entity. The City will not be responsible for another governmental entity's debts. Each governmental entity will place their own orders with the successful Bidder and be responsible for ensuring full compliance with the ITB specifications. Prior to other governmental entities placing orders, the City will notify the successful Bidder of their intent.

Please indicate below if you will permit other governmental entities to purchase from your agreement with the City.

- Yes, Others can purchase No, Only the City of Killeen can purchase.

SIGNATURE: 

DATE: 10/27/2021

PRINTED NAME: Varand Vartanian

Point of contact to resolve issues (delivery or invoice):

NAME: Varand Vartanian

TITLE: President

ADDRESS: 32 W. 8th St. suite no 607, Erie, PA 16501

EMAIL ADDRESS: support@gdicompany.com

PHONE: 814-616-7800

FAX: 202-204-8444

Copyright Materials:

Materials listed in your bid submission that are copyrighted shall be listed clearly under a copyrighted materials section within your bid submission.

Non-Endorsement:

As a result of the selection of a bidder to supply products and/or services to the City of Killeen, the City of Killeen is neither endorsing nor suggesting that the bidder's product is the best or only solution. The bidder agrees to make no reference to the City of Killeen in any literature, promotional material, brochures, sales presentation or the like without the express written consent of the City of Killeen.

Organization of Your Bid Submission:

Your bid submission shall be organized in the format shown within this bid. Any exception(s) or additional information provided shall be referenced in your bid submission behind the bid packet.

Signature of Acceptance:

By the signature hereon affixed, the bidder hereby certifies that neither the bidder nor the entity represented by the bidder, or anyone acting for such entity has violated the antitrust laws of the State of Texas, codified in Section 15.01 et seq., Texas Business and Commerce Code, or the Federal antitrust laws, nor communicated directly or indirectly, prior to the bid opening with any competitor or any other person engaged in such line of business.

Undersigned acknowledges that addenda 1 through 1 have been taken into account as part of this bid.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session. This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a). By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code. A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

N/A

2 Check this box if you are filing an update to a previously filed questionnaire.

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information in this section is being disclosed.

N/A

Name of Officer

This section (Item 3 including subparts A, B, C, & D) must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

Yes No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more?

Yes No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4



Signature of vendor doing business with the governmental entity

10/26/2021

Date

Adopted 8/7/2015

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

1 of 1

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY CERTIFICATION OF FILING

Certificate Number:
2021-817353

Date Filed:
10/27/2021

Date Acknowledged:

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

Green Dream International
Erie, PA United States

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

City of Killeen, Texas

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

22-02
Pavement Marking services

4	Name of Interested Party	City, State, Country (place of business)	Nature of interest (check applicable)	
			Controlling	Intermediary

5 Check only if there is NO Interested Party.

6 UNSWORN DECLARATION

My name is Varand Vartanian, and my date of birth is 12/14/1956.

My address is 32 W. 8th St. suite no 607, Erie, PA, 16501, USA.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Erie County, State of PA on the 27th day of October, 2021.
(month) (year)

Signature of authorized agent of contracting business entity
(Declarant)

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	<p>1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. Green Dream International LLC</p> <p>2 Business name/disregarded entity name, if different from above Same as above</p> <p>3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.</p> <p><input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate</p> <p><input checked="" type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ <u>C</u></p> <p>Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.</p> <p><input type="checkbox"/> Other (see instructions) ▶</p>	<p>4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):</p> <p>Exempt payee code (if any) _____</p> <p>Exemption from FATCA reporting code (if any) _____</p> <p><small>(Applies to accounts maintained outside the U.S.)</small></p>
	<p>32 W. 8th St. suite no 607</p> <p>Erie, PA 16501</p>	<p>Requester's name and address (optional)</p>
	<p>7 List account number(s) here (optional)</p>	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number									
or									
Employer identification number									
4	6		0	5	2	2	7	5	8

Part II Certification

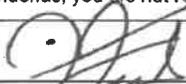
Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here

Signature of U.S. person ▶



Date ▶ Aug 5, 2021

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

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.

SPECIFICATIONS

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 attached.

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). 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. Please note the City's holiday listing noted in the information and instructions to bidders sections that may affect the delivery date of an order. Some space has been provided for bidder's comments in the ITB form under exceptions.

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/m²/lx)
 - Yellow markings: 175 mcd/m²/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 Retroreflector 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 retroreflector 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.

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.

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.

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, "Epoxyes 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.

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.

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.

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.

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.

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.

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:

666.4.3.2.1. 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.

Special Provision to Item 666

Reflectorized Pavement Markings with Retroreflective Requirements



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/m²lx
- Yellow markings: 100 mcd/m²lx

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., "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/m²/lx)
- Yellow markings: 175 mcd/m²/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/m²/lx)
- Yellow markings: 175 mcd/m²/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.

Special Provision to Item 672

Raised Pavement Markings



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:

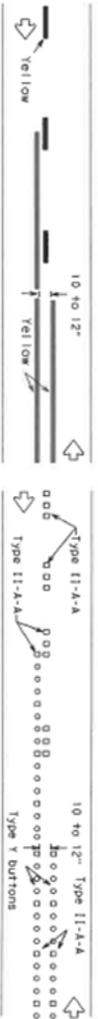
672.3.1. Raised Pavement Markers Patch. Raised Pavement Markers will be in accordance with Item 672, "Raised Pavement Markers." Unless otherwise directed in the General Notes and Specification Data, a patch will be defined as 1,000 LF or less along the center line of the roadway. The Engineer will determine 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.

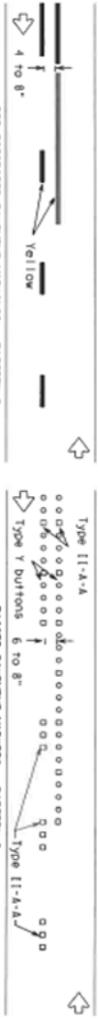
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

PAVEMENT MARKING PATTERNS



REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

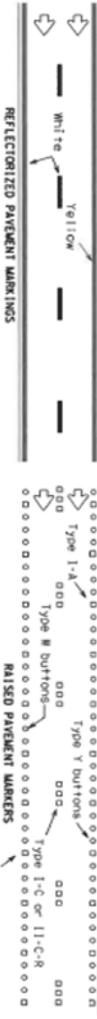
RAISED PAVEMENT MARKERS - PATTERN A



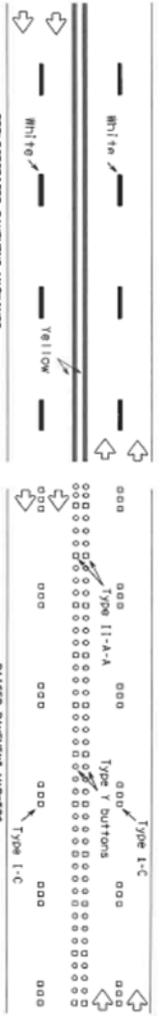
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

RAISED PAVEMENT MARKERS - PATTERN B

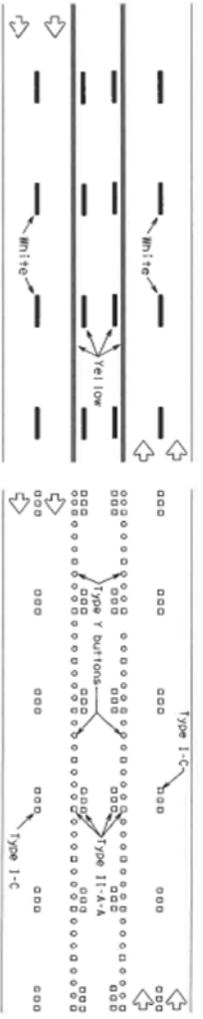
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



EDGE & LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



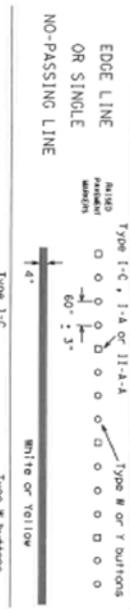
TWO-WAY LEFT TURN LANE



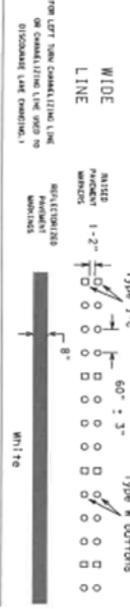
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



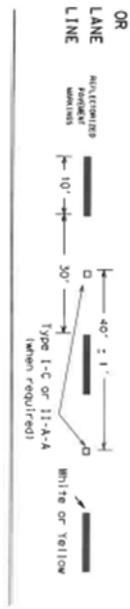
SOLID LINES



WIDE LANE



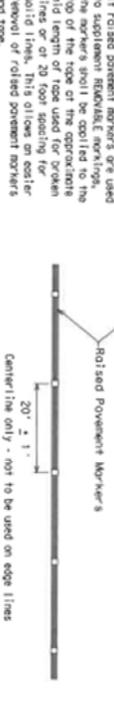
BROKEN LINES



AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS



Raised pavement markers used as standard pavement markings shall be from the approved products 1147 and meet the requirements of them 612 - RAISED PAVEMENT MARKERS.

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 14

DATE:	06-14-09	BY:	06/14/09	CHKD:	06/14/09
FILE:	1-25-2-14	REVISED:	06/14/09	DESIGNED:	06/14/09
				APPROVED:	06/14/09

Texas Department of Transportation
Traffic Operations Division
SHEET 12 OF 12