

**NOTIFICATION OF ADDENDUM  
ADDENDUM NO. 1  
DATED MAY 21, 2010**

Bid No.: CCRMA 2010-001

Project: Port Access Road Project

Location: From SH 48 to Captain Donald L. Foust Road, Brownsville, TX

County: Cameron

Ladies/Gentlemen

Attached please find an addendum on the above captioned project. Included in the attachment is an addendum notification which details the changes and the respective proposal pages and Plan Sheets which were added and/or changed.

Except for the new bid insert pages, it is unnecessary to return any of the pages attached.

Bid insert pages must be returned with the bid proposal submitted to the Authority.

You are required to acknowledge receipt of this addendum on the Addendum Acknowledgement form contained in your bid proposal by placing a mark in the box next to the respective addendum.

Failure to acknowledge receipt of this addendum in your bid proposal will result in your bid not being read.

SUBJECT: PLANS AND PROPOSAL ADDENDUM NO 1  
PROJECT: PORT ACCESS ROAD PROJECT  
COUNTY: CAMERON  
LETTING: MAY 27, 2010

### **PROPOSAL ADDENDUMS**

PLAN SHEETS: 2, 9, 37A

BID TAB

INVITATION TO BID

GENERAL NOTES

SPECIAL PROVISIONS

### **PLAN SHEETS**

#### Sheet 2 – DETAILED INDEX OF SHEETS

- Added Sheet 37A under “ROADWAY STANDARDS”

#### Sheet 8 – GENERAL

- Removed first two sentences on 9<sup>th</sup> paragraph that reads, “Use a self-contained vacuum...” and “Maintain one self-contained vacuum...”

#### Sheet 8A – ITEM 100 – PREPARING RIGHT OF WAY

- Removed entire item

#### Sheet 8C – ITEM 341 – DENSE-GRADED-HOT-MIX ASPHALT (QC/QA)

- Removed 4<sup>th</sup> paragraph that reads, “Level-up will be placed before...”

#### Sheet 8D – ITEM 421 – HYDRAULIC CEMENT CONCRETE

- Removed 4<sup>th</sup> paragraph that reads, “Air entrain all concrete...”

#### Sheet 8D – ITEM 462 – CONCRETE BOX CULVERTS AND STORM DRAINS

- Revised heading on sheet Q-12 from “Strom” to “Storm”

Sheet 8E – ITEM 585 – RIDE QUALITY FOR PAVEMENT SURFACES

- Removed last sentence on 4<sup>th</sup> paragraph that reads, “This includes ramps and...”

Sheet 8E – ITEM 644 – SMALL ROADSIDE SIGN SUPPORTS AND ASSEMBLIES

- Revised 5<sup>th</sup> paragraph to read “Sign types for which design details are not shown on the plans shall conform with the latest edition of TxDOT’s “Standard Highway Sign Design for Texas” Manual”

Sheet 8E – ITEM 662, 666 AND 8251 – WORK ZONE PAVEMENT MARKINGS AND REFLECTORIZED PAVEMENT MARKINGS

- Revised 2<sup>nd</sup> paragraph to read, “Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with test method Tex 828-B, will not be paid for, the roadway will be re-striped at no additional compensation.”

Sheet 9 – SUMMARY TABLE OF ESTIMATED QUANTITIES

- Added Item 4523 2001 and quantity
- Revised quantity for Item 9990 2001 from “174” to “232”

Sheet 37A – CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

- New sheet

**BID TAB – SECTION “E”**

- Added Item 4523 2001 and quantity
- Revised quantity for Item 9990 2001 from “174” to “232”

**INVITATION TO BID – SECTION “B”**

- Removed 2<sup>nd</sup> paragraph on sheet B-2 that reads, “In addition, bidders will be required to demonstrate...”
- Removed 10<sup>th</sup> paragraph on sheet B-2 that reads, “Each Proposal must be accompanied by an ...”

**GENERAL NOTES – SECTION “Q”**

- GENERAL

- Removed first two sentences on 9<sup>th</sup> paragraph on sheet Q-3 that reads, “Use a self-contained vacuum...” and “Maintain one self-contained vacuum...”
- ITEM 100 – PREPARING RIGHT OF WAY
  - Removed entire item on sheet Q-6
- ITEM 341 – DENSE-GRADED HOT-MIX ASPHALT (QC/QA)
  - Removed 4<sup>th</sup> paragraph on sheet Q-10 that reads, “Level-up will be placed before...”
- ITEM 421 – HYDRAULIC CEMENT CONCRETE
  - Removed 4<sup>th</sup> paragraph on sheet Q-11 that reads, “Air entrain all concrete...”
- ITEM 462 – CONCRETE BOX CULVERTS AND STORM DRAINS
  - Revised heading on sheet Q-12 from “Strom” to “Storm”
- ITEM 585 – RIDE QUALITY FOR PAVEMENT SURFACES
  - Removed last sentence on 4<sup>th</sup> paragraph on sheet Q-14 that reads, “This includes ramps and...”
- ITEM 644 – SMALL ROADSIDE SIGN SUPPORTS AND ASSEMBLIES
  - Revised 5<sup>th</sup> paragraph on sheet Q-14 to read “Sign types for which design details are not shown on the plans shall conform with the latest edition of TxDOT’s “Standard Highway Sign Design for Texas” Manual”
- ITEM 662, 666 AND 8251 – WORK ZONE PAVEMENT MARKINGS AND REFLECTORIZED PAVEMENT MARKINGS
  - Revised 2<sup>nd</sup> paragraph on sheet Q-15 to read, “Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with test method Tex 828-B, will not be paid for, the roadway will be re-stripped at no additional compensation.”

## **SPECIAL PROVISIONS – SECTION “R”**

- SPECIAL SPECIFICATIONS
  - Added “Specification 4523: Steel Casing Pipe” on sheet R-5
- SPECIAL PROVISIONS, 001---001---RMA, Definitions of Terms
  - 1.154 Standards – Revised 1<sup>st</sup> sentence on sheet R-15 from “Texas Authority of Transportation” to “Texas Department of Transportation”

**SPECIAL SPECIFICATIONS – SECTION “S”**

- SPECIAL SPECIFICATIONS ITEM 4523, Steel Casing Pipe
  - New specification
- SPECIAL SPECIFICATIONS ITEM 9990, Composite Railroad Grade Crossings
  - 5 Payment – Revised 2<sup>nd</sup> sentence on sheet S-11 to include “welded joints”, “replace existing ties with new ties within the limits of the crossing” and “and equipment, materials, tools, labor and incidentals”

Cameron County Regional Mobility Authority

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PORT ACCESS ROAD PROJECT

BID NO. CCRMA 2010-001

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INVITATION TO BID

For the construction of a roadway facility consisting of grading, flexible base, lime treated subgrade, asphaltic concrete pavement, concrete pavement, metal beam guard fence, signing, pavement markings, cross culverts and bridge structures.

Payment for the project will be made as defined in the specifications.

Sealed Proposals for the above project will be received by the Cameron County Regional Mobility Authority (CCRMA) (2<sup>nd</sup> Floor), Attn: Pete Sepulveda, Cameron County Courthouse, 1100 East Monroe Street, Brownsville, Texas 78520 on or before 4:00 P.M. C.S.T. Thursday, May 27, 2010. The bids will be publicly opened and read at the same location (2<sup>nd</sup> Floor – Commissioners' Courtroom) at 4:01 P.M. C.S.T. (as per CCRMA time clock) on deadline due date.

Bids received later than the date and time above will not be considered.

Please return bid ORIGINAL ONE (1) and one (1) copy in sealed envelope. Be sure that return envelope shows the Bid Number, Description and is marked "SEALED BIDS".

The work under this Contract shall be Substantially Complete within one hundred six (106) working days after the initial notice to proceed (NTP). The Contractor will be allowed up to an additional twenty (20) working days for Final Acceptance. The contract time includes the mobilization and materials procurement period. The complete list of estimated quantities is located in the bid tab. The principal items of work are as follows:

- Preparing Right of Way
- Excavation & Embankment
- Flexible Base / Cement Treated Base
- Dense-Graded Hot Mix Asphalt
- Concrete Pavement (Jointed, Cont. Reinf.)
- Roadway Bridges
- Pile Foundations
- Riprap
- Concrete Box Culverts
- Drainage Structures (inlets, manholes, etc.)
- Barricades, Signs, & Traffic Handling

To receive and subsequently submit Official Proposals for this Contract, prospective bidders shall, meet the following requirements:

- Be fully prequalified by the Texas Department of Transportation (TxDOT) for bidding on State projects and have a bidding capacity of \$4,000,000.00.
- Be registered with the State of Texas.

The Authority cannot be held liable in the event a party is unable to submit a valid bid due to delay in the prequalification procedure. Securing prequalification and the timing thereof, shall at all times be the sole responsibility of the Prospective Bidder.

The contract will be awarded in accordance with CCRMA Procurement policy. A copy of the Procurement Policy is available online at the CCRMA website (<http://cameroncountyrma.org>).

A Pre-bid Meeting will be held for this project on Tuesday, May 11, 2010 at 1:30 P.M. C.S.T, at the Commissioner's Courtroom, Cameron County Courthouse (2<sup>nd</sup> Floor), 1100 East Monroe Street, Brownsville, Texas 78520. The Pre-bid meeting is **MANDATORY** and prospective bidders must attend in order to have their proposal opened.

Prequalified Bidders must submit a Bid Proposal Request Form and be notified of approved prequalification in order to obtain an Official Proposal. Bid Proposal Request Forms shall be requested in writing starting Wednesday, May 12, 2010 (Attn: Mr. Greg Garcia, HNTB Corporation, 1805 Ruben Torres Boulevard, Suite A-15, Brownsville, TX 78521). **Submit Bid Proposal Request Form no later than Wednesday, May 19, 2010, 5:00 P.M. C.S.T. (Attn: Mr. Greg Garcia, HNTB Corporation, 1805 Ruben Torres Boulevard, Suite A-15, Brownsville, TX 78521).** Official Proposals will be made available via email.

Plans and proposals for the project may be obtained from CCRMA or HNTB, at the contractors' expense.

Standard Specifications (Texas Department of Transportation "Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges", 2004) which form an integral part of this Contract, are available on line at the Texas Department of Transportation (TxDOT) website.

### **PROPOSAL REQUIREMENTS**

Each Proposal must be accompanied by a Bid Guaranty consisting of either a Bid Guaranty Check in the amount of at least five (5) percent of the Total Bid Amount or a Bid Bond (on the form provided) in the amount of at least five (5) percent of the Total Bid Amount. The Bid Guarantee Check must be a cashier's check, money order, or teller's check issued by a state or national bank, savings and loan association, or a state or federally chartered credit union and made payable to the Cameron County Regional Mobility Authority. The Bid Guarantee Check must be dated on or before the letting date and must be less than 90 days old.

An 11.5% goal for disadvantages business enterprises (DBE) is established for this project.

CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

David Alex, Chairman

Brownsville, Texas

BID TAB - UNOFFICIAL

ITEM NO	ITEM NO	ITEM NO	DESCRIPTION AND UNIT PRICE IN WRITING	UNIT OF MEASURE- MENT	APPROXIMATE QUANTITY	UNIT PRICE (IN FIGURES) DOLLARS & CENTS	AMOUNT (IN FIGURES) DOLLARS & CENTS
666	2195		PAVEMENT SEALER 24" _____ _____ _____	Per Linear Foot	LF	977.00	
666	2219		PAVEMENT SEALER (ARROW) _____ _____ _____	Per Each	EA	1.00	
666	2220		PAVEMENT SEALER (WORD) _____ _____ _____	Per Each	EA	1.00	
672	2012		REFL PAV MRKR TY I-C _____ _____ _____	Per Each	EA	82.00	
672	2015		REFL PAV MRKR TY II-A-A _____ _____ _____	Per Each	EA	152.00	
4523	2001		STEEL CASING PIPE _____ _____ _____	Per Linear Foot	LF	62.00	

UNOFFICIAL DOCUMENT  
NOT FOR BIDDING PURPOSES

BID TAB - UNOFFICIAL

ITEM NO	ITEM NO	ITEM NO	DESCRIPTION AND UNIT PRICE IN WRITING	UNIT OF MEASUREMENT	APPROXIMATE QUANTITY	UNIT PRICE (IN FIGURES) DOLLARS & CENTS	AMOUNT (IN FIGURES) DOLLARS & CENTS
5261	2001		GEOGRID REINFORCEMENT (TY 1) _____ _____ _____ Per Square Yard	SY	13175.00		
8251	2003		RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL) _____ _____ _____ Per Linear Foot	LF	950.00		
8251	2006		RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL) _____ _____ _____ Per Linear Foot	LF	5194.00		
8251	2018		RE PM W/RET REQ TY I (X) 4" (SLD) (100 MIL) _____ _____ _____ Per Linear Foot	LF	6642.00		
8251	2033		PAVEMENT SEALER 4" _____ _____ _____ Per Linear Foot	LF	12786.00		
9990	2001		COMPOSITE RR GR CROSS _____ _____ _____ Per Linear Foot	LF	232.00		
*Special: Designates Special Measurement Items as defined in Article 9.2 of the Contract Documents.							
<b>OFFICIAL TOTAL BID AMOUNT NTP:</b>							

UNOFFICIAL DOCUMENT  
NOT FOR BIDDING PURPOSES

If working near power lines, comply with the appropriate sections of Local Legal Requirements, Texas State Law, and Federal Regulations relating to the type of work involved.

In the event of unforeseen utility adjustment, the Contractor will prosecute their work in such a manner and sequence as to allow the adjustments to be made. If in the opinion of the Engineer, the Contractor is delayed by virtue of the adjustment of these utilities, an extension of working time may be granted, if necessary.

Match existing cross slopes, as directed. Consider subsidiary to the pertinent Items.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Sweep, mow, and remove all litter on the right of way, within the project limits, to keep the jobsite in a neat and presentable condition at all times. Perform this work as directed by the Engineer.

Remove all construction debris and surplus material generated by the construction work within the project limits. Perform this work as directed. Consider subsidiary to the pertinent Items.

Trim vegetation around signs and other obstructions. Consider subsidiary to pertinent Items.

Supply litter barrels in adequate numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Protect all areas of the right of way, which are not included in the actual limits of the proposed construction areas from destruction. Exercise care to prevent damage to trees, vegetation, and other natural surroundings. Areas not to be disturbed will be as directed. Restore any area disturbed because of the Contractor's operations to a condition as good as, or better than, before the beginning of work.

Damage to existing pipes and SET's due to Contractor operations shall be repaired at the Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist in the sole opinion of the Engineer.

Prior to contract letting, bidders may obtain a free computer diskette or a computerized transfer of files (from the Engineer's office) that contains the earthwork information. The cross-sections created for this project are for non-construction purposes only. It is the responsibility of the prospective bidder to validate the data.

Work in this contract is required to be done on Port of Brownsville and BRG Railroad property. Cooperate with these agencies and comply with all of their requirements including obtaining any training they require before performing work on the property.

#### **ITEM 132. Embankment**

Embankment (DENS CONT) shall be Type C with a max. PI of 40. Material used as embankment material in the top two feet below the bottom of Flexible Base shall meet the following requirements based on preliminary tests and such other tests found necessary by the Engineer.

1. The material shall be such as to produce a well-bonded embankment and shall have a minimum PI of 8 and a maximum PI of 30.
2. The sulfate content, when tested in accordance with Tex 145-E, shall not exceed 8000 ppm.

It is the Contractor's responsibility to advise the Engineer of the location of the source sufficiently in advance to avoid delay.

#### **ITEM 166. Fertilizer**

Fertilizer rate is based on a rate of 100 Lbs. of Nitrogen per acre. The Nitrogen-Phosphorous-Potassium (NPK) ratio shall include a minimum of 5 percent phosphorous and 5 percent Potassium. Fertilizer shall be homogenized.

#### **ITEM 164. Seeding for Erosion Control**

During drill seeding operations, application methods shall be in accordance with the method shown in the Standard Specification Book.

SS-1 Tacking Agent shall be a ratio of 2:1, two (Emulsion) to one (water) and applied at a rate of 0.05 gallons per square yard. The SS-1 Tacking Agent required for Drill Seed operations, will not be paid for directly, but will be subsidiary to Item 164 "Drill Seeding". When a tacking agent is used Watering will not be used with the Drill Seed Method.

Cool Season or Warm Season Grasses shall be included as part of Item 164 (See Table 3 and/or Table 4 in the Standard Specification Manual for dates and seed type).

Seed mixture

The following is a list of seed types that have been found to grow in High Salt Areas:

Rhode Grass	(2.0 lbs/Acre)
Bermuda Grass	(1.2 lbs/Acre)
Alkali Sacaton	(1.9 lbs/Acre)
Blue Panic	(2.0 lbs/Acre)

**ITEM 247. Flexible Base**

Flexible Base Type E will be composed of caliche (argillaceous Limestone, calcareous or calcareous clay particles) and may contain stone, conglomerate, gravel, sand or granular materials when these materials are in situ with the caliche.

Blended material for Flexible Base TY E GR 4

The Contractor may blend base material with another caliche source or with crushed concrete, meeting the requirements for TY "D" materials, provided a minimum of 50% caliche is used. The crushed concrete may contain sand or granular materials. Stabilizing additives will not be allowed in the raw crushed concrete base. Acceptance will be under the following conditions:

Condition One (1): When both components of the blend in their individual stockpiles meet all the physical requirements of this Item, then field blending will be allowed.

Condition Two (2): When only one component of the blend passes the physical requirements of this Item, the materials shall be blended through a plant for stockpile testing and approval.

Flexible Base (TY E GR 4) shall conform to the following requirements:

BEFORE LIME IS ADDED

Retained on Sq. Sieve	Percent Retained
2"	0
½"	20-60
No. 4	40-75
No. 40	70-90
Max. PI:	15
Max. Wet Ball PI:	15
Wet Ball Mill Max Amount:	50

Min. Comp. Strength PSI:	150 at 15 PSI lateral pressure
Triaxial Test	Tex-117-E

The Wet Ball Test (Tex-116-E) shall be run and the Plasticity Index of the material passing the No. 40 sieve shall be determined (Wet Ball PI).

After 1% lime (laboratory) is added to unlimed material

Max PI	12
Min. Comp. Strength PSI:	180 at 15 PSI Lateral Pressure
Triaxial Test (Lime Treated)	Tex-121-E

Two (2) percent lime (by weight) will be incorporated into the Flexible Base in the field at the CCRMA's expense in accordance with the provisions of Items 260.

The percent of density as determined by Compaction Ratio (Tex-113-E) for the new Flexible Base shall be a minimum of 98%.

The Contractor's attention is called to the fact that certain existing and/or proposed structures may be within the limits of the Flexible Base. It shall be the Contractor's responsibility to perform construction operations without damage to these structures.

For water added under Item 247, the sulfate content will not exceed 3000 ppm and the chloride content will not exceed 3000 ppm.

In locations where a high sulfate concentration is present in the soils, allow sufficient reaction time between the lime and sulfates (mellowing) to occur before placement of subsequent pavement layer.

**ITEM 260. Lime Treatment (Road Mixed)**

The Contractor's attention is called to the fact that certain existing and/or proposed structures are within the limits of the lime-treated Subgrade. Unless otherwise directed by the Engineer, these structures shall be installed before the final rolling of this Subgrade. It shall be the Contractor's responsibility to perform the proper lime treating operation without damage to these structures.

The slurry method of applying lime will be required, except when the lime is to be added to naturally wet materials as directed by the Engineer.

For this project, the Engineer will direct a random number of lime trucks to be check weighed.

The percent of density as determined by Tex-121-E for the new and salvage Flexible Base shall be a minimum of 98% for all courses.

In order to avoid damaging the Geogrid, add lime to the first lift of new base and/or salvage base at a central mixing site or mixing plant away from the construction area. The Engineer shall approve the site or plant location and method of mixing. This will not be paid directly, but will be subsidiary to this Item.

#### **ITEM 301. Asphalt Antistripping Agents**

Lime TY A or B shall be added as an Antistripping additive between the rates of 1 % minimum 2.0% maximum by weight for item 341. If the Hamburg wheel test cannot be met within these limits, Liquid Antistripping agents as approved by the Engineer may be used in conjunction with lime for item 341.

#### **ITEM 310. Prime Coat (Cutback Asphaltic Material)**

The Contractor shall exercise diligence in the application of asphalt by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

Do not apply subsequent courses over the initial prime coat any earlier than the day after the prime coat was applied, unless otherwise authorized or directed by the Engineer.

#### **ITEM 316. Surface Treatments**

In addition to cleaning by brooming of paved surfaces to be sealed as required by this Item, blading may also be necessary to clean dirt and grass from edges of the pavement and/or turnout areas. The cost of this blading will not be paid for directly, but will be considered subsidiary to the various bid Items of the project.

When applying surface treatment at railroad crossings, a strip of paper shall be placed over the rail and flange areas across the pavement.

The type and grade of asphalt as shown on the plans and/or as directed by the Engineer, shall be used on these projects. Asphalt cement will be used during the warm season (usually April 15th to September 15th). An emulsified asphalt will be used during the cooler season (usually September 15th to April 15th), if permitted in writing by the Engineer. The emulsified asphalt, if used, shall be HFRS-2P. Estimated quantities shown for the bid Item is based on an average of the estimated rates of application for asphaltic cement and emulsified asphalt. These rates should be used for estimating and comparison purposes only.

The one or two-course surface treatment shall be in place for a sufficient period of time in the opinion of the Engineer, for the surface treatment to properly dry and cure before placing the Asphaltic Concrete Pavement.

Traffic will not be permitted on the surface treatment unless authorized by the Engineer.

When emulsified asphalt is used, do not apply subsequent courses over the surface treatment any earlier than the day after the surface treatment was applied, unless otherwise authorized or directed by the Engineer.

**ITEM 341. Dense-Graded Hot-Mix Asphalt (QC/QA)**

The contractor shall exercise diligence in the application of "Tack Coat" by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly, but shall be considered subsidiary to this bid Item.

This project will require the following minimum surface aggregate Classifications:

County	CSJ	Highway	Classification
CAMERON		Port Access Road	A

All longitudinal joints adjacent to a travel way shall be constructed with a joint maker providing a maximum ½-inch vertical edge and a minimum 6:1 edge taper or as approved by the Engineer.

The Hamburg wheel Test requirement for PG 64 binder will be 5,000 passes @ 0.5 inch rut depth.

**ITEM 400. Excavation and Backfill for Structures**

If the Contractor elects to cut pavement (existing/detour) for structural work beyond that required by the construction phasing shown in the plans and approved by the Engineer, it shall be restored at his expense and backfilled to its original condition or better in accordance with Item 400.

Unless shown otherwise in the plans, use a 1-ft depth for Item 400 Structural Excavation (Special) for gravel bedding needed below drainage structures with unstable material.

#### **ITEM 420. Concrete Structures**

Use membrane curing, Type 2, for concrete curb, gutter and combined curb and gutter, concrete medians, directional islands and sidewalks.

Pay bent concrete as plan quantity.

#### **ITEM 421. Hydraulic Cement Concrete**

Provide Sulfate Resistant Concrete for all concrete piling and drilled shafts.

Provide equipment at the batch plant for determining the free moisture and/or absorption of aggregates in accordance with applicable TXDOT Test.

Provide the following items for concrete batch inspection in accordance with specifications outlined in DMS-10101, "Computer Equipment":

- (1) One Desktop Microcomputer or One Laptop Microcomputer
- (2) One Integrated Printer/Scanner/Copier/Fax Unit
- (3) Contractor-Furnished Software
- (4) Hardware

#### **ITEM 427. Surface Finishes for Concrete**

Provide surface finishes for concrete as follows:

- (1) Bridge overpass and underpass structures – surface area I, opaque sealer coating (color to be determined by the Engineer).
- (2) Bridge waterway crossings and bridge class box culvert structures – surface area II, opaque sealer coating (color to be determined by the Engineer).

Concrete traffic barrier/railing (roadway and bridge), and retaining wall coping - opaque sealer coating (color to be determined by the Engineer) to all exposed surfaces.

#### **ITEM 432. Riprap**

Provide Class "A" concrete minimum for riprap aprons placed around all box culvert and pipe safety end treatments.

#### **ITEM 462. Concrete Box Culverts and Storm Drains**

Provide joints in pre-cast concrete box culverts using any of the methods specified in Item 464, except mortar joints.

Provide pre-cast concrete boxes to expedite traffic handling unless otherwise shown on the plans.

Provide the Engineer with the casting schedule of all pre-cast concrete boxes prior to beginning any fabrication.

#### **ITEM 464. Reinforced Concrete Pipe**

Use tongue and groove pipe where the RCP extends into the lime treated subgrade. The 4-foot depth restriction for heavy equipment passage over pipe structures is voided. The Contractor will be responsible for any construction damage to these facilities.

Do not use mortar joints.

#### **ITEM 467. Safety End Treatment**

All Type II SET's shall have riprap, Class "A" minimum, aprons as shown on the plans. The contractor may submit an alternate precast SET design for approval by the Engineer.

#### **ITEM 502. Barricades, Signs and Traffic Handling**

Shadow vehicles equipped with Truck-Mounted Attenuators are required.

Replace/relocate all regulatory signs removed due to construction operations with a same sign on fixed support(s) immediately upon its removal. First obtain project Engineer approval before removing any regulatory roadway sign. Required flaggers are to be available to direct traffic during sign intermediate down time.

Relocate any Directional Sign Assemblies removed during construction operations immediately upon their removal.

These signs shall be relocated to a location in accordance with the Latest Version of the "Texas Manual on Uniform Traffic Control Devices". In no case will a sign be removed without a replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly, but shall be considered subsidiary to Item 502.

Notify BRG Railroad at least 48 hours in advance of commencing any work by the Contractor in which any person or equipment will be within 25' of any track or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within 25' of any track. No work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed or stored within 25' of any track at any time for any reason, unless and until a railroad flagman is provided to watch for trains. If a railroad flagman is provided by the Contractor, required training and/or

certification for the railroad flagman will require approval by BRG Railroad. If a railroad flagman or other special protective or safety measures are provided by BRG Railroad, BRG Railroad will bill Contractor for such expenses incurred. This will not be paid for directly, but will be considered subsidiary to Item 502.

#### **ITEM 504. Field Office and Laboratory**

Furnish (1) Field Office (Type C).

Provide the following items in accordance with specifications outlined in DMS-10101, "Computer Equipment":

Furnish (1) laptop computer, (1) Secure Digital (SD) Card and Reader/Writer and (1) integrated printer/fax/copier and internet service. Provide broadband internet service where available.

#### **ITEM 540. Metal Beam Guard Fence**

The optional terminal anchor post with the terminal connector will be required as shown on the Metal Beam Guard Fence Standard.

#### **ITEM 544. Guardrail End Treatments**

Label "end treatment type" on backside of unit at time of installation.

#### **ITEM 585. Ride Quality for Pavement Surfaces**

Quality control results shall be submitted to CCRMA or designated representative the next working day after each day's paving.

Pavement areas with public turnout intersections that carry major traffic volumes will not be subjected to inertial profiler testing. These areas shall be evaluated using the 10-ft. Straightedge.

Diamond grinding shall be used to remove localized roughness.

Use Surface Test Type B pay adjustment schedule 1 to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Use Surface Test Type B pay adjustment schedule 2 to evaluate ride quality of the CRCP travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

#### **ITEMS 636. Aluminum Signs**

Complete sign blanks and panels shall be handled and stored at the job site in such a manner that corners, edges and faces are not damaged. Finished sign blanks shall be stored in either a weather-proof warehouse or outside and off the ground in a vertical position. All paper, cardboard and chemically treated separators and packaging shall be removed prior to outside storage.

#### **ITEM 644. Small Roadside Sign Supports and Assemblies**

All signs shall be installed as shown in the plans and in accordance with the current edition of the "Texas Manual on Uniform Traffic Control Devices" and the "Sign Crew Field Book" (SCFB).

All signs shall be erected according to the locations shown on the signing layout sheets except that a sign may be shifted in order to secure a more desirable location. All sign locations will be staked as shown in the plans and as approved. It is the intent of the plans to erect all roadside traffic signs with the sign edge a minimum of 6 feet from the edge of the shoulder, or if none, 12 feet from the edge of the travel lane. In curb and gutter sections the sign edge shall be a minimum of 2 feet from the face of the curb.

For this project, aluminum type sign blanks as provided for under Item 636 will be required for all proposed signing installed under Item 644. Aluminum sign blanks less than 7.5 square feet shall be 0.08 inch thick, sign blanks 7.5 to 15 square feet shall be 0.100 inch thick and sign blanks greater than 15 square feet shall be 0.125 inch thick.

All excess excavation shall be spread uniformly inside the right of way as directed and shall be included in the price of these Items.

Sign types for which design details are not shown on the plans shall conform with the latest edition of TxDOT's "Standard Highway Sign Design for Texas" Manual.

Signs shown to be removed shall include the complete sign installation and separate the sign post at the concrete foundation. The concrete foundation shall be disposed in accordance with this Bid Item. Except for concrete foundations, all removed sign panels, sign posts, and hardware shall remain the property of the Department. All removed sign installations shall be completely disassembled. All salvageable sections of sign panels shall be recycled by TxDOT. The removed sign material will be required to be hauled to the maintenance yard closest to the project. No signs shall be removed without prior approval.

#### **ITEM 658. Delineator and Object Marker Assemblies**

Delineator assemblies shall be installed 8 feet from the edge of the shoulder unless restricted by some obstruction, in which case, the delineator assembly shall be placed between 2 and 8 feet from the edge of the shoulder.

Bi-directional installation of object markers shall be by any satisfactory method.

**ITEMS 662, 666, AND 8251. Work Zone Pavement Markings and Reflectorized Pavement Markings**

All permanent pavement markings and work zone pavement markings for this project under these Items shall be 0.100 inches (100 mil) thick thermoplastic.

Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with test method Tex 828-B, will not be paid for; the roadway will be re-stripped at no additional compensation.

Pavement surface preparation for markings and markers will not be paid for directly, but shall be considered subsidiary to Item 666.

Prior to any striping operations, an on-site coordination meeting between all the parties involved will be required to review striping details and requirements to ensure quality work.

The beads used on this project shall meet the requirements of Departmental Materials Specification DMS-8290, Glass Traffic Beads Texas Type II & III. Use a 50% Type II/ 50% Type III mix utilizing a double drop system with Type II beads dropped first.

**ITEM 5261. Geogrid Base Reinforcement**

Provide a construction plan to the engineer detailing how the base will be lime treated without damaging the Geogrid Base Reinforcement placed on top of the subgrade.

SPECIAL PROVISION TO ITEM 643 (643---001)  
SPECIAL PROVISION TO ITEM 672 (672---034)

SPECIAL SPECIFICATIONS

Specification 4523: Steel Casing Pipe

Specification 5261: Geogrid Base Reinforcement

Specification 8251: Reflectorized Pavement Markings with Retroreflective Requirements

Specification 9990: Composite Railroad Grade Crossings

- they share common officers, directors, or stockholders;
- a family member of an officer, director, or stockholder of one firm serves in a similar capacity in another of the firms;
- an individual who has an interest in, or controls a part of, one firm either directly or indirectly also has an interest in, or controls a part of, another of the firms;
- the firms are so closely connected or associated that one of the firms, either directly or indirectly, controls or has the power to control another firm;
- one firm controls or has the power to control another of the firms; or,
- the firms are closely allied through an established course of dealings, including but not limited to the lending of financial assistance.

**1.149. Bid.** The offer of the bidder for performing the work described in the plans and specifications including any changes made by addenda.

**1.150. Family Member.** A family member of an individual is the individual's parent, parent's spouse, step-parent, step-parent's spouse, sibling, sibling's spouse, spouse, child, child's spouse, spouse's child, spouse's child's spouse, grandchild, grandparent, uncle, uncle's spouse, aunt, aunt's spouse, first cousin, or first cousin's spouse.

**1.151. Bid Form.** The form provided by the Department used by the bidder to submit a bid. The bid form is a Department emailed bidder's form (traditional proposal submitted manually).

**1.152. Authority.** The Cameron County Regional Mobility Authority, an agency created under Texas Transportation Code Chapter 370 and approved by the Texas Transportation Commission, together with its members, partners, employees, agents officers, directors, shareholders, representatives, consultants, successors, and assigns. The Authority's principal office is presently located at 1100 E. Monroe Street, Brownsville, Texas 78520.

**1.153. Full Completion of all Work (or to Fully Complete all Work).** The completion of all work specified under this Contract as evidenced by the Formal Acceptance thereof by the Authority.

**1.154. Standards.** Whenever the Plans and/or Specifications refer to "Standard Sheets" or "Design Details" such reference shall be construed to mean the set of drawings issued by the Design Divisions, Texas Department of Transportation, and entitled "Standard Sheets". Only those standards or standard drawings specifically referred to by number on the Plans or in the various Contract Documents are applicable to work on this Contract.

Whenever in the various Contract Documents the term, "Authority" or "State" appears, it shall be replaced by the term, "Cameron County Regional Mobility Authority." Similarly, the term,

**SPECIAL SPECIFICATION**  
**ITEM 4523**  
**Steel Casing Pipe**

1. **Description.** This item shall govern for the furnishing and installation of Steel Casing Pipe in accordance with the plans, specifications and as directed by the Engineer, for use as encasement pipe for carrier lines of water, sewer, gas or other products.
2. **Material.** The Steel Pipe shall be standard weight welded steel pipe of the diameter as called for in the plans or as directed by the Engineer. The steel pipe shall conform to the requirements for ASTM Designation A-36, ASTM A515, grade 60 or ASTM A572, grade 42 with a minimum wall thickness of 3/8".

Roundness: The pipe diameter as measured along any single plane shall not vary more than 1% from the specified diameter.

Circumference: The outside circumference shall not vary more than +/- 1 % from the nominal circumference based on the specified diameter, or +/- 3/4" maximum.

Wall Thickness: The actual wall thickness of the steel pipe sections shall not vary more than 5 % under the nominal wall thickness specified.

Straightness, the maximum straightness deviation in any 10' length shall be 1/8". The maximum straightness deviation in fabricated sections up to 40' shall be 3/8".

Steel pipe shall be installed/provided in accordance with the following items:

Item 400	Excavation and backfill for Structures"
Item 442	"Metal for Structures"
Item 448	"Structural Field Welding"

**3. Construction Methods.**

The Steel Pipe shall be placed at the locations shown on the plans. All steel casing connections shall be welded. Steel casing shall be closed at each end using synthetic rubber end seals or brick/block with mortar grout.

Casing spacers shall be used to install the carrier pipe inside the encasement pipe. Casing spacers shall fasten tightly onto the carrier pipe so that when the carrier pipe is being installed, the spacers will not move along the pipeline. Casing spacers shall be doubled on each end of encasement.

Projection type casing spacers shall be constructed sections of high density Polyethylene. Installation and size of spacers shall be per manufacturer's recommendations.

4. **Measurement.** Steel Casing Pipe of the sizes specified on the plans, will be measured by the linear foot, complete in place.
5. **Payment.** The work performed and material furnished as prescribed by this item, measured as provided under "Measurement", will be paid for at the unit price bid for "Steel Casing Pipe" of the size specified, which price shall be full compensation for furnishing and placing all Steel Pipe, excavation and backfill, and for all welding, labor, materials, equipment, tools, and incidentals.

**SPECIAL SPECIFICATION**  
**ITEM 5261**  
**Geogrid Base Reinforcement**

1. **Description.** Furnish and place geogrid base reinforcement in accordance with the lines and grades shown on the plans or as directed.
2. **Materials.** Provide geogrid base reinforcement, of the type shown on the plans, meeting the requirements of DMS-6240 "Geogrid for Base/Embankment Reinforcement". Use roll widths and lengths shown on the plans or as approved.
3. **Construction.** Prepare the subgrade as indicated on the plans or as directed. Set string lines for alignment if directed. Install geogrid in accordance with the lines and grades as shown on the plans. Place base material in lift thicknesses and compact as shown on the plans or as directed. Do not operate tracked construction equipment on the geogrid until a minimum fill cover of 6 in. is achieved. Rubber tire construction equipment may operate directly on the geogrid at speeds of less than 5 mph if the underlying material will support the loads. Where excessive substructure deformation is apparent, correct grid placement operations as recommended by the manufacturer or as directed
  - A. **Geogrid Placement.** Orient the geogrid length as unrolled parallel to the direction of roadway. Overlap geogrid sections as shown on the plans or as directed. Use plastic ties at overlap joints or as directed. Placement of geogrid around corners may require cutting and diagonal lapping. Pin geogrid at the beginning of the backfill section as directed. Keep geogrid taut at the beginning of the backfilling section but not restrained from stretching or flattening.
    1. **Longitudinal Joints.** Overlap longitudinal joints by a minimum of 1 ft. Space longitudinal ties 10 ft. to 20 ft. or as directed.
    2. **Transverse Joints.** Overlap transverse joints by a minimum of 1 ft. Space transverse ties 4 ft. to 5 ft. or as directed.
  - B. **Damage Repair.** As directed, remove and replace contractor damaged or excessively deformed areas without additional compensation. Lap repair areas a minimum of 3 ft in all directions. Tie each side of repair grid in at least 3 locations but do not exceed normal construction spacing; tie spacing for odd shapes will be as directed. Repair excessively deformed materials underlying the grid as directed
4. **Measurement.** Geogrid base reinforcement will be measured by the square yard of roadway placement as shown in the plans with no allowance for overlapping at transverse and longitudinal joints.

5. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” are paid for at the unit bid price for “Geogrid Base Reinforcement” of the type specified. This price is full compensation for furnishing, preparing, hauling and placing materials including labor, materials, freight, tools, equipment and incidentals.

**SPECIAL SPECIFICATION**  
**ITEM 8251**  
**Reflectorized Pavement Markings with Retroreflective Requirements**

1. **Description.** Furnish and place reflectorized pavement markings of the types, colors, sizes, widths, and thickness shown on the plans.
2. **Materials.**
  - A. **Type I Marking Materials.** Furnish in accordance with Departmental Material Specification DMS-8220, "Hot Applied Thermoplastic."
  - B. **Type II Marking Materials.** Furnish in accordance with DMS-8200, "Traffic Paint."
  - C. **Glass Traffic Beads.** Furnish drop on glass beads conforming to DMS-8290, "Glass Traffic Beads." When furnishing a combination of Type II and III, apply separately in equal portions (by weight) and apply Type III first.
    1. **Type I Markings.** Furnish drop on glass beads that are:
      - Type II or a combination of Type II and III, when applying markings at a thickness of 0.060 in. (60 mils);
      - Type II, Type III, or a combination of Type II and III, when applying markings at thicknesses greater than 0.060 in. (60 mils);
      - Type II on transverse markings such as stop bars, cross walks, or striping installed with hand line machines.
    2. **Type II Markings.** Furnish drop on glass beads that are Type II, Type III, or a combination of Type II and III, when applying Type II markings as final markings.
  - D. **Labeling.** Use clearly marked containers that indicate color, mass, material type, manufacturer, and batch number.
3. **Equipment.**
  - A. **General Requirements.** Use pavement marking application equipment that:
    - is maintained in satisfactory condition;
    - meets or exceeds the requirements of the National Board of Fire Underwriters and Texas Railroad Commission for this application;
    - uses an automatic bead dispenser attached to the pavement marking equipment;
    - can provide continuous mixing and agitation of the pavement marking material; and

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

Use a mobile retroreflector approved by the Construction Division and certified by the Texas Transportation Institute Mobile Retroreflector Certification Program.

Use a portable retroreflector that:

- uses 30-meter geometry and meets the requirements described in ASTM E 1710;
- has either an internal global positioning system (GPS) or the ability to be linked with an external GPS with a minimum accuracy rating of 16.4 ft. 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.

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

- a minimum of 40,000 ft. of 4-in. solid or broken markings per day at the specified thickness over five consecutive days;
- linear markings up to 8 in. wide in a single pass;
- markings other than solid or broken lines at an approved rate;
- a center-line and no-passing barrier-line configuration consisting of one broken line with two solid lines at the same time to the alignment, spacing, and thickness shown on the plans;
- white lines from both sides;
- lines with clean edges, uniform cross-section and thickness, and reasonably square ends;
- skip lines between 10 and 10 1/2 ft., an approximate stripe-to-gap ratio of one to three, and a stripe-gap cycle between 39 1/2 ft. and 40 1/2 ft.;
- beads uniformly and almost instantly upon the marking as the marking is being applied; and
- beads uniformly during the application of two adjacent lines. Each line must have an equivalent bead yield rate and embedment;
- Type II and Type III beads from separate bead applicators, when applying a combination of Type II and Type III beads.

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

**A. General.** Obtain approval for the sequence of work and estimated daily production.

Place markings on roadways already open to traffic with minimum interference to the operations of that roadway. 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.

Provide markings with uniform and distinctive characteristics when observed in accordance with Tex-828-B. When minimum retroreflectivity requirements are specified, these values will be used to measure retroreflectivity performance.

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

1. **Type I Markings 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 observe the underside of the tarpaper in contact with the pavement. Pavement is dry if there is no condensation on the tarpaper.
2. **Type II Markings Application.** Place a 1 sq. ft., clear piece of plastic on the pavement and weigh down the edges. The pavement is dry if, after observation for 15 minutes, no condensation occurs on the underside of the plastic.

Apply markings:

- using dimensions, colors and at locations shown in 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;
- free of blisters and with no more than 5%, by area, holes or voids;
- with uniform cross section and thickness;
- with clean and reasonably square ends;
- that are reflectorized when observed in accordance with Tex-828-B for the entire performance period of 15 days and meet the minimum retroreflective requirements as specified in Section 4.D of this Special Specification; and
- using personnel skilled and experienced with installation of pavement markings.

Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at your own expense in accordance with Item 677.

- B. Surface Preparation.** Unless otherwise shown on the plans, prepare surfaces in accordance with this section.

1. **Cleaning for New Asphalt Surfaces and Retracing of All Surfaces.** For new asphalt surfaces (less than 3 years old) and retracing of all surfaces, air-blast or broom the pavement surface 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.
  2. **Cleaning for Old Asphalt and Concrete Surfaces (Excludes Retracing).** For old asphalt surfaces (more than 3 years old) and all concrete surfaces, clean 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.
  3. **Sealer for Type I Markings.** For asphalt surfaces more than 3 years old or for concrete, apply a pavement sealer 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 unless otherwise shown on the plans. Follow the manufacturer's directions for application of acrylic or epoxy sealers. When the sealer becomes dirty after placement, clean by washing or in accordance with Section 4.B.1, "Cleaning for New Asphalt Surfaces and Retracing of All Surfaces." Place the sealer in the same configuration and color (unless clear) as the Type I markings unless otherwise shown on the plans.
- C. **Application.** Apply markings on surfaces with a minimum surface temperature of 50°F, when measured in accordance with Tex-829-B.

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 costs associated with replacing the markings if required.

1. **Type I Markings.** Apply within the temperature limits recommended by the material manufacturer. Note: if during a spray application, operations cease for 5 min. or longer, flush the spray head by spraying marking material into a pan or similar container until the material being applied is at the proper temperature for application.

Apply on clean, dry pavements (meeting moisture test described above).

Apply Type I markings with a minimum thickness of:

- 0.100 in. (100 mils) for new surface treatments involving Item 316 or Item 318;
- 0.060 in. (60 mils) for retraced pavement markings; or
- 0.090 in. (90 mils) for all other Type I markings.

The maximum thickness for Type I markings is 0.180 in. (180 mils). Measure the thickness of markings in accordance with Tex-854-B, Part I

2. **Type II Markings.** Apply markings at an application rate of 15–20 gal./mi. for a solid 4 in. line and same rate adjusted proportionally for other widths

**D. Retroreflective Requirements.** Meet the following minimum retroreflectivity values for edge line markings, center-line/no passing barrier-line, and lane lines when measured anytime after 3 days but not later than 10 days after application:

1. **Type I Markings.**

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

2. **Type II Markings.**

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

**E. Retroreflectivity Measurements.** Use a mobile retroreflectometer unless otherwise shown on the plans.

1. **Mobile Reflectometer Measurements.** Provide mobile measurements averages for every 0.1 miles unless otherwise specified or approved by the Engineer. Take measurements on each section of roadway for each series of markings (i.e. edge-line, center skip line, each line of a double line, etc.) and for each direction of travel. Take all measurements in the direction of traffic flow, except on broken centerline on two-way roadways, take measurements in both directions. Furnish measurements in compliance with Special Specification, “Mobile Retroreflectivity Data Collection for Pavement Markings,” unless otherwise approved by the Engineer. 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 hours in advance of taking any measurements.

If 30% or more of the average measurements fail within a one-mile segment, restripe once at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material or 15 to 20 gallons per mile of Type II marking material. Take measurements every 0.1 miles after 3 days but before 10 days of this second application within that mile segment for that series of markings. If 30 % or more of the average measurements fall below the minimum retroreflectivity requirements, restripe using 15 to 20 gallons per mile of Type II marking material at the

Contractor's expense. If the markings do not meet minimum retroreflectivity after this 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. If the Engineer does not require removal of the markings, restripe using 15 to 20 gallons per mile of Type II marking material at the Contractor's expense until minimum retroreflectivity requirements are met.

2. **Portable Reflectometer Measurements.** When using a portable reflectometer, take a minimum of three measurements for each 1 mile section of roadway for each series of markings (i.e. edge-line, center skip line, each line of a double line, etc.) and for each direction of travel. Take all measurements in the direction of traffic flow, except on broken centerline on two-way roadways, take measurements in both directions. The spacing between each measurement must be at least 1000 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.

If two or more of the measurements taken on a specific series of markings within each mile segment fall below the minimum retroreflectivity values, take a minimum of five more measurements within that mile segment for that series of marking. If two or more of these measurements fail, restripe once at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material or 15 to 20 gallons per mile of Type II marking material. Take a minimum of five more measurements after 3 days but before 10 days of this second application within that mile segment for that series of markings. If two or more of these measurements fall below the minimum retroreflectivity requirements, restripe using 15 to 20 gallons per mile of Type II marking material at the Contractor's expense. If the markings do not meet minimum retroreflectivity after this 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. If the Engineer does not require removal of the markings, restripe using 15 to 20 gallons per mile of Type II marking material at the Contractor's expense until minimum retroreflectivity requirements are met.

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 VI 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 standard plans TCP (3-1) and TCP (3-2). The lead vehicle will not be required on divided highways. The traffic control plan and traffic

control devices must meet the requirements listed in Item 502. 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.

**F. Performance Period.** All markings (and replacement markings) must meet all requirements of this Specification, except for Section D., “Retroreflective Requirements,” for a minimum of 15 calendar days after installation. Remove all pavement markings that fail to meet all requirements of this Specification and replace at the Contractor’s expense unless otherwise directed. Replace all failing markings within 30 days of notification.

**5. Measurement.** This Item will be measured by the foot. Double stripes 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 sealer, epoxy sealer, or Type II markings, when used as a sealer for Type I markings, will be measured as Pavement Sealer.

**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 “Reflectorized Pavement Markings with Retroreflective Requirements” of the types, colors, sizes, widths, and thickness (Type I markings only) specified or “Pavement Sealer” of the size specified. This price will be full compensation for furnishing all materials; application of pavement markings; retroreflective readings; traffic control; and other equipment, labor, tools, and incidentals.

Surface Preparation, when shown on the plans, will be paid for under Item 678.

Final work-zone pavement markings (Type II), which can be used as a sealer for Type I markings, will be paid for under this Item.

When replacement Type II markings are required due to damage to the original markings from rain, sleet, hail, etc., and the original markings were placed at the direction of the Department, the plan quantity requirements under “Measurement” do not apply to the original and replacement markings. The Contractor will be paid for the actual quantity of original and replacement markings at the unit bid price bid for that bid item.

**SPECIAL SPECIFICATION  
ITEM 9990  
Composite Railroad Grade Crossings**

1. **Description.** Furnish and install composite railroad grade crossings.
2. **Materials.** Provide the following composite based material or an approved equal.

Endurance<sup>®</sup> -XL Composite Crossing  
LT Resources, Inc.  
15814 Champion Forest Drive, #302  
Spring, TX 77379

An approved equal must have the following minimum performance requirements and be approved by the Engineer.

Specific Gravity (D792)	1.05 ± .06
Compressive Strength (D-695-02a)	19.3 MPa (2800 psi)
Flexural Strength (D6109)	7 MPa (1000 psi)
Tensile Strength (D638-08)	7.7 MPa (1118 psi)
Izod Impact (D4812-06)	6.1 ft·lb/in
Taber Abrasion	0.30 gram weight loss after 2000 cycles with H-22 abrasion wheel
Hardness Shore D	≈ 52
Thermal Expansion (E228)	≈ 110 μm/m-°C
Softening Temperature	≈ 110 °C 230 °F
Fungus and Termites	Impervious
Water Absorption (D1037)	<0.1%
Fatigue Testing	Zero failures during 25k three point bend cycle test. Loads applied across maximum unsupported span approaching four times legal axle load values.
UV Resistance	Additives and cross-linked polyethylene used to negate UV degradation.

3. **Construction.** Install composite panels in accordance with the manufacturer's shop drawings. Composite panels damaged in the process of handling or placing shall be replaced immediately at the Contractor's expense. Information regarding assembly, installation, and/or manipulation of the composite panels may be obtained from LT Resources, Inc., 15814 Champion Forest Drive, #302, Spring, TX 77379.

- Construct approach asphalt paving of the length and width shown on the plans that conforms to TxDOT Item 341 “Dense-Graded Hot-Mix Asphalt”.
- Provide perforated drain pipe and filter fabric, as directed by the Engineer, conforming to TxDOT Item 556 “Pipe Underdrains”.

4. **Measurement.** This item will be measured by the linear foot of composite railroad grade crossing installed.

5. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid under the unit price bid for “Composite Railroad Grade Crossing” of the type specified. This price is full compensation for furnishing, installing, composite panels, replace existing ties with new ties within the limits of the crossing, adjusting tie spacing, welded joints, pipe underdrains, filter fabric and filter material, asphalt approach pavement, installation of ballast and subballast, track surfacing and alignment in the area of the crossing and for 100 ft. to either side of the crossing and equipment, materials, tools, labor and incidentals.