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ADDENDUM NO. 1

CITY OF SEGUIN BID # TF-2015-40
Pavement Maintenance Project

This addendum modifies, supplements, and is hereby made a part of the bid document referenced above.

1. See attached Slurry Seal Specifications that replace any reference to Seal Coat specifications.

2. See attached revised Bid Sheet, page 2, Add Alternate II, removing reference to "Seal Coat" and adding reference to "Slurry Seal."

Twila Wood
Purchasing Manager
City of Seguin

ITEM

207 SINGLE COURSE BITUMINOUS SLURRY SEAL

207.1. DESCRIPTION: *The work covered by this specification includes the design, testing, construction and quality control required for the proper application of slurry seal surface.*

207.2. APLLICABLE SPECIFICATIONS AND TEST METHODS:

A. Agencies.

AASHTO: American Association of State Highways and Transportation Officials
ASTM: American Society for Testing and Materials
ISSA: International Slurry Surfacing Association

B. Aggregate and Mineral Filler.

AASHTO	ASTM	Title
T2	D75	Sampling Mineral Aggregates
T27	C136	Sieve Analysis of Aggregates
T11	C117	Materials Finer than No. 200 in Mineral Aggregates
T176	D2419	Sand Equivalent Value of Soils and Fine Aggregate
T84	C128	Specific Gravity and Absorption of Fine Aggregate
T19	C29	Unit Weight of Aggregate
T96	C131	Resistance to Abrasion of Small-Size Coarse Aggregate by Use of the Los Angeles Machine
T37	D546	Sieve Analysis of Mineral Filler
T104	C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
N/A	D242	Mineral Filler for Bituminous Paving Mixtures
T127	C183	Sampling Hydraulic Cement

C. Emulsified Asphalt.

AASHTO	ASTM	Title
T40	D140	Sampling Bituminous Materials
T59	D244	Testing Emulsified Asphalt
M140	D977	Specification for Emulsified Asphalt
M280	D2397	Mixing, Setting and Water Resistance Test To Identify A Quick-Set Emulsified Asphalt

D. Residue From Emulsion.

AASHTO	ASTM	Title
T59	D244	Residue by Evaporation
T49	C2397	Penetration 3.5 oz (100 gm) at 5 Seconds 77°F (25°C)

E. Slurry Seal System.

ASTM	ISSA	Title
N/A	TB 101	Guide for Sampling Slurry Mix for Extraction Test
N/A	TB 106	Measurement of Slurry Seal Consistency
N/A	TB 109	Test Method for Measurement of Exce Asphalt in Bituminous Mixtures by Use of a Loaded-Wheel Tester
N/A	TB 111	Outline Guide Design Procedure for Slurry Seal
N/A	TB 112	Method of Estimate Slurry Seal Spread Rates and To Measure Pavement Macrotexture
N/A	TB 114	Wet Stripping Test for Cured Slurry Seal Mixes
N/A	TB 115	Determination of Slurry Seal Compatibility
N/A	TB 39	Method of Classified Emulsified Asphalt, Aggregate Mixtures by Modified Cohesion Test Measurement of Set and Cure Characteristics
D3910	N/A	Design, Testing, and Construction of Slurry Seal
D2172	N/A	Quantitative Extraction of Bitumen for Bituminous Paving Mixtures

207.3. MATERIALS: Provide materials in conformance with the following Items and requirements:

A. General. The slurry seal shall consist of a mixture of an approved emulsified asphalt, mineral aggregate, mineral filler, water and specified additives, proportioned, mixed and uniformly spread over a properly prepared surface. The completed slurry seal shall leave a homogenous mat, adhere firmly to the prepared surface and have a skid resistant surface texture.

B. Asphalt Emulsion. The emulsion shall be SS-1H or CRS-2H in conformance with TxDOT Item 300, Section 2.D. "Emulsified Asphalt" with a 4% Latex additive milled into the emulsion by the emulsion manufacturer. All shipments of latex modified emulsion shall be accompanied by a shipping ticket and a certificate of compliance which shall be provided to the Engineer.

AASHTO	ASTM	Title	Specification Criteria
Test on Emulsion			
T59	D244	Residue After Distillation	60% Minimum
Test on Emulsion Residue			
T49	C2397	Penetration at 77°F (25°C)	40 – 90

C. Mineral Aggregate. Provide a crushed aggregate from a single source meeting the requirements of Table 1 and Table 2. Unless otherwise shown on the plans, furnish aggregate with a minimum "B" Surface Aggregate Classification (SAC) as defined in TxDOT's Bituminous Rated Source Quality Catalog (BRSQC). Include the amount of mineral filler added to the mix in determining the total minus No. 200 aggregate fraction.

Table 1
Aggregate Gradation Requirements
Tex-200-F, Part II (Washed)
Cumulative % Retained

Sieve Size	Type I	Type II	Type III
½"	0	0	0
⅜"	0	0	0 – 1
#4	0	0 – 10	6 – 14
#8	0 – 10	10 – 35	35 – 55
#16	10 – 35	30 – 55	54 – 75
#30	35 – 60	50 – 70	65 – 85
#50	58 – 75	70 – 82	75 – 90
#100	70 – 85	79 – 90	82 – 93
#200	80 – 90	85 – 95	85 – 95

Table 2
Aggregate Quality Requirements

Property	TxDOT Standard Laboratory Test Method	Requirement
Magnesium sulfate soundness, %, max.[1]	Tex-411-A	30
Sand equivalent value, %, min.	Tex-203-F	70
Los Angeles abrasion, %, max	Tex-410-A	30

1. Use design gradation for the soundness test.

D. Mineral Filler. Provide mineral filler that is free of lumps and foreign matter consisting of non-air-entrained cement meeting the requirements of DMS-4600, "Hydraulic Cement," or hydrated lime meeting the requirements of DMS-6350, "Lime and Lime Slurry." The type and amount of mineral filler needed shall be determined by a laboratory mix design and will be considered as part of the aggregate gradation. An increase or decrease of less than one percent (1%) may be permitted when the micro-surfacing is being placed if it is found to be necessary for better consistency or set times.

E. Water. Provide water that is potable and free of harmful soluble salts.

F. Other Additives. Use approved additives as recommended by the emulsion manufacturer in the emulsion mix or in any of the component materials when necessary to adjust mix time in the field.

G. F. Job-Mix Formula (JMF). Provide a mix design conforming to the proportions shown in Table 3 and meeting the requirements shown in Table 4. The mix design is subject to verification using laboratory produced mixes or trial batch mix before approval.

Provide emulsion and aggregate that are compatible so that the mixing process will completely and uniformly coat the aggregate. Design the mix so that the mixture will have sufficient working life to allow for proper placement at the predicted ambient temperature and humidity.

Table 3
JMF Proportions

Material	Proportion
Residual Asphalt	Type I - 10.0 to 16.0% by wt. of dry aggregate Type II & III – 6.0 to 9.0% by wt. of dry aggregate
Mineral Filler (Hydraulic Cement or Hydrated Lime)	0.5 to 3.0% by wt. of dry aggregate
Field Control Additive	As required to provide control of break and cure
Water	As required to provide proper consistency

Table 4
JMF Requirements

Property	TxDOT Standard Laboratory Test Method	Requirement
Wet track abrasion, g/sq. ft., max. wear value	Tex-240-F, Part IV	75
Gradation (aggregate and mineral filler)	Tex-200-F, Part II (Washed)	Table 1
Mix time, controlled to 120 sec.	Tex-240-F, Part I	Pass

H. Rate of Application. The slurry seal mixture shall be of the proper consistency at all times, so as to provide the application rate required by the surface condition. Suggested application rates are based upon the weight of dry aggregate in the mixture. Application rates are affected by the unit weight of the aggregate.

Unless a specific aggregate type and application rate are shown in the plans, the following recommended aggregate types and average single application rates are suggested for the various street classifications and situations:

Aggregate Type	Suggested Placement Locations	Suggested Application Rate
Type I	Local Type A w/o Bus Traffic	8 - 12 lb/yd^2
Type II	Local Type A and B Streets	10 - 20 lb/yd^2
Type III	Collectors and Arterials Wheel Ruts	15 - 30 lb/yd^2 See Section 239.4.K., "Ruts"

207.4. EQUIPMENT: All methods employed in performing the work and all equipment, tools, and machinery used for handling the material and executing any part of the work shall be subject to the approval of the Engineer before the work is started, and whenever found unsatisfactory they shall be changed and improved as required. All equipment, tools, machinery and containers used must be kept clean and maintained in a satisfactory condition.

A. Mixing Equipment. Furnish a self-propelled slurry seal mixing machine with:

- self-loading devices to promote continuous laying operations;
- sufficient storage capacity for mixture materials;
- individual volume or weight controls that will proportion each material to be added to the mix;
- continuous flow mixing with a revolving multi-blade mixer capable of discharging the mixture on a continuous flow basis;
- opposite side driving stations;

- full hydrostatic control of the forward and reverse speed during operation;
- a water pressure system and nozzle-type spray bar immediately ahead of the spreader box and capable of spraying the roadway for the width of the spreader box;
- a mechanical-type spreader box equipped with paddles or other devices capable of agitating and spreading the materials throughout the box;
- a spreader box with devices capable of providing lateral movement or side shift abilities; and
- a spreader box with a front seal and adjustable rear strike-off. Provide an adjustable secondary rear strike-off, if required.

Calibrate and properly mark each control device that proportions the individual materials. Equip the aggregate feed with a revolution counter or similar device capable of determining the quantity of aggregate used at all times. Provide a positive-displacement-type emulsion pump with a revolution counter or similar device capable of determining the quantity of emulsion used at all times. Provide an approved mineral filler feeding system capable of uniformly and accurately metering the required material.

B. Scales. Scales used for weighing aggregates and emulsion must meet all requirements of TxDOT Item 520, "Weighing and Measuring Equipment." The weighing equipment for aggregates may be either a suspended hopper or a belt scale.

C. Asphalt Storage and Handling Equipment. When storage tanks are used, furnish a thermometer in each tank to indicate the asphalt temperature continuously. Keep equipment clean and free of leaks. Keep asphalt materials free from contamination.

D. Cleaning Equipment. Power brooms and blowers, air compressors, vacuum sweepers, water flushing equipment, and hand brooms shall be suitable for cleaning the pavement surface and cracks therein.

E. Auxiliary Equipment. Hand squeegees, shovels and other equipment shall be provided as necessary to perform the work.

207.5. CONSTRUCTION:

A. General. Produce, transport, and place slurry seal as specified in this Item or on the plans. The slurry mixture shall be of the desired consistency as it leaves the mixer and no additional elements shall be added. No lumping, balling, or unmixed aggregate shall be permitted. No segregation of the emulsion and aggregate fines from the coarse aggregate will be permitted.

If the coarse aggregate settles to the bottom of the mix, the slurry will be removed from the pavement. Care shall be taken not to overload the spreader box, which shall be towed at a slow and uniform rate not to exceed 5 miles per hour. The action of the squeegee in the spreader box shall permit free flow of the slurry into all surface voids and cracks. A sufficient amount of slurry seal shall be fed to the box to keep a full supply against the full width of the squeegee. The mixture shall not be permitted to overflow the front sides of the spreader box. Adjacent lanes shall be lapped at the edges a minimum dimension which will provide complete sealing at the overlap.

spreader box. If water is used, cracks shall be allowed to dry thoroughly before applying slurry seal.

2. **Protection.** Manholes, valve boxes, drop inlets and other service entrances shall be protected from the slurry seal by a suitable method. The Contractor shall cover all raised pavement markers in a manner to protect and insure the integrity of the markers prior to placing the slurry seal and shall remove such covers after the completion of micro-surfacing so that the markers will remain fully functional. Any markers damaged by the Contractor's operations shall be repaired or replaced at no cost to the City.

3. **Tack Coat.** The Engineer may require a tack coat if the surface to be covered is extremely dry and raveled, or is concrete or brick. If required by the Engineer, the tack coat should consist of one part emulsified asphalt/three parts water. The emulsified asphalt should be the same as used in the mix. The distributor shall be capable of applying the dilution evenly at a rate of 0.05 to 0.10 gal/yd^2. The tack coat shall be allowed to cure before application of the slurry seal.

4. **Crack Pre-Treatment.** If shown on the plans, pre-treat the cracks in the surface with an acceptable crack sealer prior to the application of the micro-surfacing.

E. Material Transfer. Minimize construction joints by providing continuous loading of material while placing slurry seal. Ensure that oversized material has been removed prior to transferring the aggregates to the mixing machine.

F. Placing. Spread the mixture uniformly to the lines and grades shown on the plans or as directed by means of a mechanical type spreader box. Shift the spreader box when necessary to maintain proper alignment. Clean the spreader box as necessary to minimize clumps. Set and maintain the spreader box skids to prevent chatter in the finished mat. Prevent loss of material from the spreader box by maintaining contact between the front seal and the road surface. Adjust the rear seal to provide the desired spread. Adjust the secondary strike-off, if present, to provide the desired surface texture.

G. Curing. Protect the finished mat from traffic until the mix cures and will not be damaged by traffic. Adjust mixture properties according to humidity conditions and ambient air temperatures to allow uniformly moving traffic on completed travel lanes within 1 hr. after placement with no damage to the surface. Protect other locations subject to sharp turning or stopping and starting traffic for longer periods when necessary.

H. Production Testing. Provide access to the mixing unit discharge stream for sampling purposes. Produce a slurry seal mixture that will meet the tolerances specified in Table 5. Remove and replace or use other approved means to address material that does not meet these requirements, at no additional cost.

Table 5
Production Tests

Property	TxDOT Standard Laboratory Test Method	Requirement
Asphalt content, % by wt.	Tex-236-F1 or asphalt meter readings	Design target ±0.5% and within limits of Table 1
Gradation, % retained	Tex-200-F, Part II (washed)[1]	#8 sieve and larger: ±5 from design gradation. #16 sieve and smaller: ±3 from design gradation.[2]

1. Dried to constant wt. at 230°F ±10°F.
2. Material passing #200 sieve including the mineral filler must conform to the limitations of the master gradation shown in Table 1.

I. **Workmanship.** Remove and replace slurry material exhibiting evidence of poor workmanship at no additional cost.

1. **Finished Surface.** Provide a finished surface that has a uniform texture free from excessive scratch marks, tears, or other surface irregularities. Marks, tears, or irregularities are considered excessive if:

- more than 1 is at least ¼ inch wide and at least 10 feet long in any 100 feet of machine pull,
- more than 3 are at least ½ inch wide and more than 6 inches long in any 100 feet of machine pull, or
- any are 1 inch wide or wider and more than 4 inches in length.

2. **Construction Joints.** Place longitudinal joints on lane lines unless otherwise directed. Provide longitudinal and transverse joints that are uniform and neat in appearance. Provide construction joints that have limited buildup and that have no gaps between applications. Joints with buildup will be considered acceptable if:

- no more than ½ inch vertical space exists between the pavement surface and a 4 foot straightedge placed perpendicular to the longitudinal joint and
- no more than ¼ inch vertical space exists between the pavement surface and a 4 foot straightedge placed perpendicular to the transverse joint.

3. **Edges.** Provide an edge along the roadway centerline, lane lines, shoulder, edge of pavement, or curb line that is uniform and neat in appearance. The edge is considered acceptable when:

- it varies no more than ±3 inches from a 100 foot straight line on a tangent section and
- it varies no more than ±3 inches from a 100 foot arc on a curved section.

J. **Miscellaneous Areas.** Use a single-batch-type lay-down machine or other approved method to place materials on ramps or other short sections. Lightly dampen the surface before placing the mix. Provide 100% coverage that is uniform in appearance and comparable to that produced by the spreader box.

207.6. MEASUREMENT: Slurry seal will be measured by the ton or square yard of the composite single course bituminous slurry seal as shown in the plans. The composite slurry seal mixture is defined as the asphalt emulsion, aggregate, and mineral filler.

A. **Aggregate.** The quantity of aggregate used in the accepted portion of work will be measured by net ticket weight of each individual load of aggregate based on dry weight of aggregate. Weigh the aggregate at the project stockpile site unless otherwise approved. Use either a suspended hopper scale or a belt scale meeting the requirements of TxDOT Item 520, "Weighing and Measuring Equipment." The calculated weight of mineral filler based on the accepted portion of work will be used for measurement and included in the total aggregate weight.

B. Asphalt Emulsion With Latex Additive. The quantity of asphalt emulsion with latex in the accepted portion of work will be measured by the ton of material based on the accepted load tickets issued from the manufacturer. At the completion of the project, any unused emulsion will be weighed back and deducted from the accepted asphalt emulsion quantity delivered.

207.7. 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 per ton or square yard for "Slurry Seal." This price is full compensation for preparing the existing surface (including removing existing raised pavement markers); furnishing, hauling, preparing, and placing materials; and equipment, labor, tools, and incidentals.

207.8. BID ITEM:

Item 207.1 - Single Course Bituminous Slurry Seal - per square yard

Item 207.2 - Single Course Bituminous Slurry Seal - per ton

TOTAL PROPOSAL **$ _____**
(Summation of Add Alternate I, Items 1 through 2)

ADD ALTERNATE II

12 36,800 SY Slurry Seal, complete and in place,
Per square yard

FOR _____DOLLARS

AND_____ CENTS $_____ $_____

TOTAL PROPOSAL **$ _____**
(Summation of Add Alternate II)

he above prices shall include all labor, materials, overhead, profit, insurance, etc. to cover the finished work of the kinds called for.

The work proposed to be done shall be accepted when fully completed and finished in accordance with the plans and specifications to the satisfaction of the City Engineer.
The undersigned Bidder hereby declares that he has visited the site of the work and has carefully examined the contract documents pertaining to the work covered in the above bid, and that the bid prices contained in the proposal have been carefully checked and are submitted as correct and final.

The Contractor agrees to complete the project on which he has bid, as specified and shown on the plans, within 90 consecutive calendar days.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the scheduled closing time for receiving bids.

Enclosed with this proposal is a Proposal Bond in the sum of 5% of total proposal, which it is agreed shall be collected and retained by the Owner as liquidated damages in the event his proposal is accepted by the Owner within ninety (90) days after the bids are received and the undersigned fails to execute the contract for the Owner within ten (10) days after date said proposal is accepted, otherwise said check or bond shall be returned to the undersigned upon demand.

_____ _____
Business Name Authorized Signature

_____ _____