CALHOUN COUNTY COMMISSION
ENGINEERING DEPARTMENT
160 SEATON DRIVE
ANNISTON, ALABAMA 36205
TELEPHONE (256) 237-4657

RODNEY MCCAIN
County Engineer

INVITATION TO BID- FY25-42

AUGUST 19, 2024

FOR THE CONSTRUCTION OF:
FY25-42 Micro Surface Paving

CALHOUN COUNTY, ALABAMA

Bid of
Contractor Name: _____

Of (City, State): _____

ALDOT Contractor Identification Number: _____
(To be used to document E-Verify)

Alabama General Contractors License Number: _____

For the Construction Of: Micro Surface Paving of Various County Roads

The specifications are hereto attached.

In order to be considered, bids must be received at the location and time below:

Calhoun County Commission
1702 Noble Street Suite 103
Anniston, Alabama 36201
Phone: (256)241-2800

BEFORE: 2:00 PM ON TUESDAY, SEPTEMBER 17, 2024
Bids will be opened as soon thereafter as practicable. Bid Award, if any, will be made at the next available regularly scheduled meeting of the Calhoun County Commission.

Bidder's Initials: _____

NOTICE TO CONTRACTORS

Calhoun County is taking bids for labor, equipment, materials, and any incidentals required to complete the work of the following items required for the Micro Surface Paving Bid for Calhoun County. This bid is intended to comply with the Rebuild Alabama Act, No. 2019-2, and Alabama Code Title 39, the Alabama Public Works Law. Bidders shall be required to comply with the provisions of the Rebuild Alabama Act, No. 2019-2 and Title 39 of the Alabama Code regardless if the requirement is explicitly detailed in the bid invitation or not. This bid shall be in effect from 10/1/2024 until 9/30/2025 covering any Proceed Orders issued by Calhoun County during that time frame.

Sealed bids will be received by the Calhoun County Commission at the Calhoun County Courthouse Annex, Ken Joiner Administration Building, 1702 Noble Street, Suite 103 Anniston, AL 36201 until 2:00 PM Central Time on Tuesday, September 17, 2024 and then publicly opened as soon thereafter as practicable. Award, if any, will be made at the next available regularly scheduled meeting of the Calhoun County Commission. Only bids from contractors or material suppliers listed on the Alabama Department of Transportation (ALDOT) approved list of contractors and material suppliers will be accepted. All bids must be marked with the word "BID" on the outside of the bid package along with Bid for Micro Surface Paving, the bid date and the Alabama General Contractor's License Number.

The Selected Contractor shall meet all Alabama Department of Transportation (ALDOT) Bonding and Licensing requirements as well as all applicable laws, ordinances, and codes of the U. S. Government, the State of Alabama, any relevant municipality, and the COUNTY, and, specifically and without limitation, shall comply with all provisions of the Beason-Hammond Alabama Taxpayer and Citizen Protection Act, commonly referred to as the Immigration Act.

All bid items shall be placed in accordance with the bid items and specifications, current revision of the Alabama Department of Transportation Standard Specifications (non-metric edition), and any Supplemental Specifications approved by the Calhoun County Engineer. All material shall meet the specifications for **Type II or Type III Micro Surfacing** provided by International Slurry Surfacing Association (ISSA) as represented in **Attachment** A. **(Type II is to meet the specification EXCEPT the rate of application. The Rate of Application shall be 20-25 lbs per square yard.)** This project is being advertised, let to contract, and administered by an awarding authority other than the Alabama Department of Transportation (ALDOT). All references made in the standard specifications and in other related and included documents of this bid, to ALDOT (except as applies to references made to ALDOT considering a bidder to be disqualified from bidding, or to the awarding authority consulting or interacting with ALDOT, etc.), the "State", the "Department" or "Highway Department", etc. shall be understood to mean the awarding authority for this project.

Should the bidder desire to offer a substitute for any item listed in this Invitation to Bid ("ITB"), a full description of the item(s) offered as substitutes shall be submitted to the County Engineer at least 48 hours before the time stated for opening the bids. The County Engineer will issue an addendum, if necessary, to all bidders who have obtained an ITB. Each bidder shall include a copy of the addendum with his/her signature indicating they had received the addendum when submitting their bid. If no addendum is issued, the substitute will not be considered in determining the lowest, responsible bidder. No additional addenda will be issued 24 hours prior to the time of the bid opening.

Signature on bid submittals must be in ink. Bid submittals made out in pencil will NOT be accepted. Calhoun County reserves the right to accept or reject any or all Bids or any portion thereof. Calhoun County Hours of Operation are 8:00 A.M. to 4:30 P.M. (Central Time) from Monday through Friday. Please remit all Bid Inquiries to Calhoun County Engineer, Calhoun County Highway Department 160 Seaton Drive Anniston, AL 36205, 256-237-4657 ATTENTION: Rodney McCain, County Engineer.

Bidder's Initials: _____

BID RESPONSE FOR
(FY25-42 MICRO SURFACE PAVING)

To the Calhoun County Commission:

The undersigned shall give Calhoun County at least 48 hours' notice in advance of performing work at any site once a Notice to Proceed has been issued by Calhoun County, Alabama. The undersigned must receive written permission to work on Saturdays, Sundays, or County recognized holidays 48 hours prior to such work commencing. Unless otherwise directed in writing by the County Engineer, the undersigned will be expected to begin work within 15 calendar days after issuance of the Notice to Proceed. The undersigned will be given a minimum of Thirty (30) Working Days as defined in the current revision of the Alabama Department of Transportation Standard Specifications, per Notice to Proceed. Each Notice to Proceed shall designate the amount of working days or calendar days allowed. Should the undersigned fail to complete the project or projects specified in the Notice to Proceed within the working days or calendar days stipulated, liquidated damages shall be assessed as defined in section 108.10 in the current revision of the Alabama Department of Transportation Standard Specifications or as amended by Special Provision.

A certified check, drawn on an Alabama Bank, or bid bond, for $10,000 made payable to the Calhoun County Commission is enclosed as evidence of good faith. Within 15 days upon notification of bid award, the undersigned shall submit a Performance Bond equal to 100% of the contract price and a Payment Bond for an amount not less than 50% of the contract price to Calhoun County along with the contract documents (substantial to the attached draft), certificate of public liability insurance, certificate of proof of workman's compensation insurance, and business license. The undersigned shall provide to the County his/her Alabama Department of Transportation (ALDOT) Vendor Identification Number as shown on the E-Verify Compliance Status List on the ALDOT website as proof of enrollment in E-Verify.

The undersigned shall submit the Advertisement of Project Completion to Calhoun County immediately following the completion and acceptance of all work required. The County Engineer will submit the advertisement to the Association of County Commissions of Alabama (ACCA) to be posted on a website maintained by ACCA for a period of four consecutive weeks.
The undersigned shall give notice of the project completion by advertising for four consecutive weeks in a newspaper of general circulation published within the city of county where the work has been performed.
Upon completion and acceptance of all work required, the undersigned will be paid upon presentation of the following:

a. A properly executed and duly certified voucher for final payment.
b. A release of all claims and claims of liens against the awarding authority arising by virtue of the contract.
c. Proof of Advertisement of project completion (AL Code 39-1-1(f) requires a 30 day waiting period after the notice has run before final settlement can be made)

The undersigned agrees: **Final payment will be made within 35 days after all the above requirements are met; Partial Payments, to be paid no more than monthly, for each project awarded pursuant to this bid award, if any. A Notice to Proceed will be provided for each project awarded under this contract; Retainage shall be withheld on each project, awarded pursuant to this bid award, as required under Code of Alabama Section 39-2-12.**

Bidder's Initials: _____

By submitting this bid, the Selected Contractor and contracting parties affirm, for the duration of the agreement, that they will not violate the federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

By submitting this **bid, the Selected Contractor and** contracting parties affirm, for the duration of this agreement to remain in compliance with Act 2016-312, the Parties hereby agree that they are not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade.

INSURANCE REQUIREMENTS

The Contractor, at its sole expense, shall obtain and maintain in full force the following insurance to protect the Contractor and the County Commission of Calhoun County, Alabama (County) at limits and coverages specified below. These limits and coverages specified are the minimum to be maintained and are not intended to represent the correct insurance needed to fully and adequately protect the Contractor.

All insurance will be provided by insurers licensed to conduct business in the State of Alabama and shall have a minimum A.M. Best rating of A- VII and must be acceptable to the County. Self-insured plans and/or group funds not having an A.M. Best rating must be submitted to the County for prior approval.

No work shall be performed until proof of compliance with the insurance requirements has been received by the County.

(a) Worker's Compensation and Employers Liability

Part One: Statutory Benefits as required by the State of Alabama

Part Two: Employers Liability

Each Accident	$3,000,000
Each Employee	$3,000,000
Policy Limit	$3,000,000

i. U. S. Longshoremen & Harborworkers' Act (USL&H) – Required if contract involves work near a navigable waterway that may be subject to the USL&H law.

ii. Maritime Endorsement (Jones Act) –
Endorsement required if contract involves the use of a Vessel.
Or include coverage for "Master or Members or Crew" under "Protection and Indemnity" coverage

Bodily Injury by accident (Each Accident)	$3,000,000
Bodily Injury by disease (Aggregate)	$3,000,000

(b) Commercial General Liability

Coverage on an Occurrence form with a combined single limit (Bodily Injury and Property Damage combined) as follows:

	Projects
Each Occurrence	$3,000,000
Personal and Advertising Injury	$3,000,000
Products/completed Operation Aggregate	$3,000,000
General Aggregate	$3,000,000

- Coverage to include:
  - Premises and operations
  - Personal Injury and Advertising Injury
  - Independent Contractors
  - Blanket Contractual Liability
  - Explosion, Collapse and Underground hazards
  - Broad Form Property Damage
  - Products/Completed Operations - This shall remain in effect for 24 months beyond completion and acceptance by owner of the project, whichever is later.
  - Railroad Protective Liability Insurance if work involves construction, demolition or maintenance operations on or within 50 feet of a railroad.

The contractor shall name the County, its officers, appointees, employees, and agents as additional insured for claims arising out of the Contractors and/or Subcontractors work. The ISO Form CG 20 10 11 85 or a comparable form that is no more restrictive shall be required. The Additional Insured form MUST include the current Operations and Products/Completed Operations of the contractor.

The naming of the additional insured does not obligate the additional insured to pay any premiums due.

- Aggregate limits to be on a "per project" basis OR an Owners and Contractors Protective Liability Policy shall be provided in the name of County, the contractor and Subcontractors. Limits to be the same as above Commercial General Liability.

(c) Automobile Liability

Covering all Owned, Non-Owned, and Hired vehicles with a Combined single limit (bodily injury and property damage combined) of $3,000,000 each accident. The policy shall name County its officers, appointees, employees, and agents as an Additional Insured.

(d) Protection and Indemnity Insurance

If the contract involves work aboard an Owned, Non-Owned or Hired Vessel, Liability coverage in the amount of $3,000,000 per occurrence shall be maintained.

(d) Indemnification and Liability

Under this section the term County shall include Calhoun County, the Calhoun County Commission, the officers, appointees, department heads, agents, and employees of the Calhoun County Commission

The County shall not be liable for any injury to the person or property of any person, firm, or corporation resulting directly or indirectly from Contractor's performance of this Contract, and the Contractor assumes full and complete responsibility therefore.

The Contractor shall further indemnify the County and hold the County safe and harmless from any and all liability, lawsuits, judgments, attorney fees, and other costs incurred by the County in defending any claim or lawsuit made against the County by any person, firm, or corporation arising directly or indirectly out of any work performed by the Contractor pursuant hereto or any breach or alleged breach of duty or responsibility of the Contractor related thereto.

Waiver of Subrogation

The Workers Compensation Policy shall contain a Waiver of Subrogation in favor of the County, its officers, appointees, employees, and agents.

Certificate of Insurance

A Certificate of Insurance evidencing the above minimum requirements must be provided to and accepted by the County PRIOR to commencement of any work on the contract. Each policy shall be endorsed by the issuing insurer to provide thirty (30) days prior written notice of cancellation to the County.

Bidder's Initials: _____

The unit prices below will apply to each project awarded pursuant to this bid award. A Notice to Proceed will be issued for each project and should be based on County Wide Pricing. A Notice to Proceed may include multiple projects or sites. Each Notice to Proceed shall note the items required and estimated quantities per project or site.

Upon request, Test Reports shall be submitted on all materials before Payment will be made. The Contractor shall furnish flagmen and portable traffic control devices (or other method approved by the County Engineer) in accordance with current revision of the Manual of Uniform Traffic Control Devices (MUTCD). The Calhoun County Engineer shall serve as the final authority for all phases of workmanship and materials.

			BID PRICE PER SQUARE YARD				
ITEM	UNIT	EST. QUANTITY	0-5000	5001-15,000	15,001-100,000	100,001-250,000	250,001 OR MORE
TYPE II MICRO SURFACING	SQ. YARD	180,000					
TYPE III MICRO SURFACING	SQ. YARD	60,000					
RUT FILLING	SQ. YARD	20,000					

The undersigned hereby states that this Bid is to the best of their knowledge; their true and correct bid, except for changes initiated herein, and is submitting these bid items for review and consideration.

Signature of Bidder (If Firm or Individual) _____

By: _____

Address of Bidder _____

Name and Address of Member of Firm _____

_____

Email: _____ **Telephone:** _____

****

Bidder's Initials: _____

Signature of Bidder (Corporation) _____

_____ Business Address _____

President

_____ Business Address _____

Secy. & Treas.

Attest: _____ Incorporated in _____

State

(Corporate Seal)

BIDS WILL NOT BE CONSIDERED UNLESS THIS FORM AND FORM FOR BID BOND IS USED AND IS SIGNED IN INK BY PRINCIPAL AND SURETY.

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

That_____of
(Name of Contractor)

_____
(Address)

as Principal, and_____of
(Name of Surety)

_____, as Surety,
(Address)

are held firmly bound unto CALHOUN COUNTY COMMISSION, a Political Subdivision of and Body Corporate in the State of Alabama as Obligee, in the full and just sum of **Ten Thousand Dollars ($10,000)** lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is herewith submitting its Bid for FY25-42 Micro Surface Paving.

The condition of this obligation is such that if the aforesaid Principal shall be awarded the contract the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms of and conditions of the Contract, then this obligation to be void; otherwise, the Principal and the Surety will pay unto the Obligee the difference in money between the amount of the Contract as awarded and the amount of the bid of the next lowest responsible bidder, which amount shall not exceed $10,000. If no other bids are received, the full amount of the bid guarantee shall be so retained or recovered as liquidated damages for such default.

Witness our hands and seals this _____ day of _____, 20____.

Signature of Individual Bidder: (Use only where bidder is an individual)

_____, Doing business as _____
(Name of Individual) (Business Name)

Business Mailing Address: _____
(Mailing Address)

Name of Corporation, Partnership, or Joint Venture:

_____

(Name of Partnership, Joint Venture or Corporation)

Business Mailing Address: _____ BY: _____ (L.S.)

(Signature and Position or Title of Officer Authorized to Sign Bids and Contracts for Firm)

_____

(Address)

Business Mailing Address: _____ BY: _____ (L.S.)

(Signature and Position or Title of Officer Authorized to Sign Bids and Contracts for Firm)

_____

(Address)

Business Mailing Address: _____ BY: _____ (L.S.)

(Signature and Position or Title of Officer Authorized to Sign Bids and Contracts for Firm)

_____

(Address)

(Corporate Seal)
Attest:

_____

(Secretary)

Name of State under the laws of which the Corporation was chartered:

_____

(State)

(Corporate Seal)
Attest:

_____

(Secretary)

Name of State under the laws of which the Corporation was chartered:

_____

(State)

SURETY: _____

(Name of Surety)

BY (AGENT): _____

(Attorney in Fact)

AGENT'S ADDRESS: _____

_____

(Mailing Address)

NOTICE: Valid Power of Attorney Must Be Attached.

END OF BID SUBMITTAL

Bidder's Initials: _____

ATTACHMENT A

Recommended Performance Guideline For Micro Surfacing

A143
(Revised September 2023)

ISSA

Innovation Through Preservation.

NOTICE

It is not intended or recommended that this guideline be used as a verbatim specification. It should be used as an outline, helping user agencies establish their particular project specification. Users should understand that almost all geographical areas vary as to the availability of materials. An effort should be made to determine what materials are reasonably available, keeping in mind system compatibility and specific job requirements. Contact ISSA for answers to questions and for a list of ISSA member contractors and companies.

International Slurry Surfacing Association
800 Roosevelt Road C-312
Glen Ellyn, IL 60137
(630) 942-6577
www.slurry.org

RECOMMENDED PERFORMANCE GUIDELINE FOR MICRO SURFACING

1. SCOPE

The intent of this guideline is to aid in the design, testing, quality control, measurement and payment procedures for the application of micro surfacing.

2. DESCRIPTION

Micro surfacing shall consist of a mixture of polymer-modified emulsified asphalt, mineral aggregate, water, and additives, proportioned, mixed and uniformly spread over a properly prepared surface as directed by the Buyer's Authorized Representative (B.A.R.). Micro surfacing should be capable of performing in variable thickness cross-sections such as ruts, scratch courses and milled surfaces. After curing and initial traffic consolidation, it should resist further compaction. The micro surfacing shall be applied as a homogeneous mat, adhere firmly to the prepared surface, and have a skid-resistant texture throughout its service life.

Micro surfacing is a quick-traffic system that allows traffic to return shortly after placement. Normally, these systems are required to accept straight, rolling traffic on a 0.5 in (12.7 mm) thick surface within one hour after placement in specific application conditions. Stopping and starting traffic may require additional curing time.

3. SPECIFICATIONS

It is normally not required to specify all tests for every project. A compilation of the results from the listed tests should be indicative of system performance. Failure to meet requirements for an individual test does not necessarily disqualify the system. If, for example, the system to be used on the project has a record of good performance, an individual test result may be waived. Agency and testing methods are listed in the appendix (see Appendix A) and form a part of this guideline.

4. MATERIALS

4.1 EMULSIFIED ASPHALT

4.1.1 GENERAL

The emulsified asphalt shall be polymer modified. The polymer material shall be milled or blended into the asphalt or emulsifier solution prior to the emulsification process. In general, a three percent (3%) polymer solids, based on asphalt weight, is considered minimum.

4.1.2 QUALITY TESTS

The emulsified asphalt, and emulsified asphalt residue, shall meet the requirements of AASHTO M 208 or ASTM D 2397 for CQS-1h, with the following exceptions:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Settlement and Storage Stability of Emulsified Asphalts, 24-h	T 59	D 6930	1% Maximum
Distillation of Emulsified Asphalt[1]	T 59	D 6997	62% Minimum
Tests on Emulsified Asphalt Residue			
Softening Point of Bitumen (Ring-and-Ball Apparatus)	T 53	D 36	135°F (57°C) Minimum
Penetration of Bituminous Materials at 77°F (25°C)	T 49	D 5	40-90[2]

[1] The temperature for this test should be held at 350°F (177°C) for 20 minutes.
[2] The climatic conditions should be considered when establishing this range.

The solubility test, if required, should be evaluated on the base asphalt.

Each load of emulsified asphalt shall be accompanied with a Certificate of Analysis/Compliance to indicate that the emulsion meets specification.

4.2 AGGREGATE

4.2.1 GENERAL

The mineral aggregate used shall be the type specified for the particular application requirements of the micro surfacing. The aggregate shall be a crushed stone such as granite, slag, limestone, chat, or other high-quality aggregate, or combination thereof. To assure the material is 100 percent crushed, the parent aggregate will be larger than the largest stone in the gradation used.

4.2.2 QUALITY TESTS

The aggregate should meet agency specified polishing values and these minimum requirements:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Sand Equivalent Value of Soils and Fine Aggregate	T 176	D 2419	65 Minimum
Soundness of Aggregates by Use of Sodium Sulfate of Magnesium Sulfate	T 104	C 88	15% Maximum w/NA_2SO_4 25% Maximum w/$MgSO_4$
Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine[1]	T 96	C 131	30% Maximum

[1]The abrasion test is run on the parent aggregate.

4.2.3 GRADATION

When tested in accordance with AASHTO T 27 (ASTM C 136) and AASHTO T 11 (ASTM C 117), the mix design aggregate gradation shall be within one of the following bands (or one recognized by the local paving authority).

SIEVE SIZE	TYPE II PERCENT PASSING	TYPE III PERCENT PASSING	STOCKPILE TOLERANCE
3/8 (9.5 mm)	100	100	
# 4 (4.75 mm)	90 - 100	70 - 90	± 5%
# 8 (2.36 mm)	65 - 90	45 - 70	± 5%
# 16 (1.18 mm)	45 - 70	28 - 50	± 5%
# 30 (600 um)	30 - 50	19 - 34	± 5%
# 50 (300 um)	18 - 30	12 - 25	± 4%
#100 (150 um)	10 - 21	7 - 18	± 3%
#200 (75 um)	5 - 15	5 - 15	± 2%

The gradation of the aggregate stockpile shall not vary by more than the stockpile tolerance from the mix design gradation (indicated in the table above) while also remaining within the specification gradation band. The percentage of aggregate passing any two successive sieves shall not change from one end of the specified range to the other end.

The aggregate will be accepted at the job location or stockpile based on five gradation tests sampled according to AASHTO T 2 (ASTM D 75). If the average of the five tests is within the stockpile tolerance from the mix design gradation, the material will be accepted. If the average of those test results is out of specification or tolerance, the contractor will be given the choice to either remove the material or blend additional aggregate with the stockpile material to bring it into compliance. Materials used in blending must meet the required aggregate quality test specifications in Section 4.2.2 before blending and must be blended in a manner to produce a consistent gradation. Aggregate blending may require a new mix design.

Screening shall be required at the stockpile if there are any problems created by oversized materials in the mix.

Type II. This aggregate gradation is used to fill surface voids, address surface distresses, seal, and provide a durable wearing surface.

Type III. This aggregate gradation provides maximum skid resistance and an improved wearing surface. This type of micro surfacing surface is appropriate for heavily traveled pavements, rut filling, or for placement on highly textured surfaces requiring larger size aggregate to fill voids.

4.3 MINERAL FILLER

Mineral filler may be used to improve mixture consistency and to adjust mixture breaking and curing properties. Portland cement, hydrated lime, limestone dust, fly ash, or other approved filler meeting the requirements of ASTM D 242 shall be used if required by the mix design. Typical use levels are normally 0.0 - 3.0 percent and may be considered part of the aggregate gradation.

4.4 WATER

The water shall be free of harmful salts and contaminants. If the quality of the water is in question, it should be submitted to the laboratory with the other raw materials for the mix design.

4.5 ADDITIVES

Additives may be used to accelerate or retard the break/set of the micro surfacing. Appropriate additives, and their applicable use range, should be approved by the laboratory as part of the mix design.

5. LABORATORY EVALUATION

5.1 GENERAL

Before the work begins, the contractor shall submit a signed mix design covering the specific materials to be used on the project. This design will be performed by a laboratory which has experience in designing micro surfacing. After the mix design has been approved, no material substitution will be permitted unless approved by the B.A.R.

ISSA can provide a list of laboratories experienced in micro surfacing design.

5.2 MIX DESIGN

Compatibility of the aggregate, polymer-modified emulsified asphalt, water, mineral filler, and other additives shall be evaluated in the mix design. The mix design shall be completed using materials consistent with those supplied by the contractor for the project. Recommended tests and values are as follows:

TEST	ISSA TB NO.	SPECIFICATION
Mix Time @ 77°F (25°C)	TB 113	Controllable to 120 Seconds Minimum
Wet Cohesion @ 30 Minutes Minimum (Set) @ 60 Minutes Minimum (Traffic)	TB 139	 12 kg-cm Minimum 20 kg-cm or Near Spin Minimum
Wet Stripping	TB 114	Pass (90% Minimum)
Wet-Track Abrasion Loss One-hour Soak Six-day Soak	TB 100	 50 g/ft² (538 g/m²) Maximum 75 g/ft² (807 g/m²) Maximum
Lateral Displacement Specific Gravity after 1,000 Cycles of 125 lb (56.71 kg)	TB 147	5% Maximum 2.10 Maximum
Excess Asphalt by LWT Sand Adhesion	TB 109	50 g/ft² (538 g/m²) Maximum
Classification Compatibility	TB 144	11 Grade Points Minimum (AAA, BAA)

The Wet Track Abrasion Test is performed under laboratory conditions as a component of the mix design process. The purpose of this test is to determine the minimum asphalt content required in a micro surfacing system. The Wet Track Abrasion Test is not recommended as a field quality control or acceptance test.

The mixing test is used to predict the length of time the material can be mixed before it begins to break. It can be a good reference check to verify consistent sources of material. The laboratory should verify that mix and set times are appropriate for the climatic conditions expected during the project.

The laboratory shall also report the quantitative effects of moisture content on the unit weight of the aggregate (bulking effect) according to AASHTO T19 (ASTM C29).

The percentage of each individual material required shall be shown in the laboratory report. Based on field conditions, adjustments within the specific ranges of the mix design may be required.

The component materials shall be designed within the following limits:

COMPONENT MATERIALS	SUGGESTED LIMITS
Residual Asphalt	5.5 - 10.5% by dry weight of aggregate
Mineral Filler	0.0 - 3.0% by dry weight of aggregate
Polymer Content	Minimum of 3.0% solids based on bitumen weight content
Additives	As needed
Water	As required to produce proper mix consistency

6. EQUIPMENT

6.1 GENERAL

All equipment, tools, and machines used in the application of micro surfacing shall be maintained in satisfactory working condition at all times.

6.2 MIXING EQUIPMENT

The machine shall be specifically designed and manufactured to apply micro surfacing. The material shall be mixed by an automatic-sequenced, self-propelled micro surfacing mixing machine. It shall be a continuous-flow mixing unit that accurately delivers and proportions the mix components through a revolving multi-blade, double-shafted mixer. Sufficient storage capacity for all mix components is required to maintain an adequate supply to the proportioning controls.

When specifying continuous machinery to minimize transverse joints, the specified machine must be capable of loading materials while continuing to apply micro surfacing. The continuous-run machine shall be equipped to provide the operator with full control of the forward and reverse speeds during application. It shall be equipped with opposite-side driver stations to assist in alignment. The self-loading device, opposite-side driver stations, and forward and reverse speed controls shall be of original-equipment-manufacturer design.

6.3 PROPORTIONING DEVICES

Individual volume or weight controls for proportioning mix components shall be provided and properly labeled. These proportioning devices are used in material calibration to determine the material output at any time.

6.4 SPREADING EQUIPMENT

The mixture shall be agitated and spread uniformly in the surfacing box by means of twin-shafted paddles or spiral augers fixed in the spreader box. A front seal shall be provided to insure no loss of the mixture at the road contact point. The rear seal shall act as a final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated that a uniform consistency is achieved and a free flow of material is provided to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry.

6.4.1 SECONDARY STRIKE-OFF

A secondary strike-off shall be provided to improve surface texture. The secondary strike-off shall be adjustable to match the width of the spreader box and allow for varying pressures to control the surface texture.

6.4.2 RUT-FILLING EQUIPMENT

When project plans require, Micro Surfacing material may be used to fill ruts, utility cuts, depressions in the existing surface, etc. Ruts of 0.5 in (12.7 mm), or greater in depth, shall be filled independently with a rut-filling box, either 5 ft (1.5 m) or 6 ft (1.8 m) in width. Ruts that are in excess of 1.5 in (38.1 mm) in depth may require multiple applications with the rut-filling box to restore the cross-section. When rutting or deformation is less than 0.5 in (12.7mm), a full width scratch course may be applied with the spreader box using a metal or stiff rubber strike-off. Apply at a sufficient rate to level the pavement surface. The leveling course may, or may not, meet the suggested application rate in the table in Section 11.2. All rut-filling and level-up material should cure under traffic for at least twenty-four (24) hours before additional material is placed.

6.5 AUXILIARY EQUIPMENT

Suitable surface preparation equipment, traffic control equipment, hand tools, and other support and safety equipment necessary to perform the work shall be provided by the contractor.

7. CALIBRATION

Each mixing unit to be used in the performance of the work shall be calibrated in the presence of the B.A.R. prior to the start of the project. Previous calibration documentation covering the exact materials to be used may be acceptable, provided that no more than 60 days have lapsed. The documentation shall include an individual calibration of each material at various settings that can be related to the machine metering devices. Any component replacement affecting material proportioning requires that the machine be recalibrated. No machine will be allowed to work on the project until the calibration has been completed and/or accepted. ISSA Inspector's Manual describes a method of machine calibration. ISSA contractors and/or machine manufacturers may also provide methods of machine calibration.

8. WEATHER LIMITATIONS

Micro surfacing shall not be applied if either the pavement or air temperature is below 50°F (10°C) and falling, but may be applied when both pavement and air temperatures are above 45°F (7°C) and rising. No micro surfacing shall be applied when there is the possibility of freezing temperatures at the project location within 24 hours after application. The micro surfacing shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

9. NOTIFICATION AND TRAFFIC CONTROL

9.1 NOTIFICATION

Homeowners and businesses affected by the construction shall be notified at least one day in advance of the surfacing. Should work not occur on the specified day, a new notification will be distributed. The notification shall be in the form of a written posting, stating the time and date that the surfacing will take place. If necessary, signage alerting traffic to the intended project should be posted.

9.2 TRAFFIC CONTROL

Traffic control devices shall be in accordance with agency requirements and, if necessary, conform to the requirements of the Manual on Uniform Traffic Control Devices. Opening to traffic does not constitute acceptance of the work

10. SURFACE PREPARATION

10.1 GENERAL

Immediately prior to applying the micro surfacing, the surface shall be cleared of all loose material, silt spots, vegetation, and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before applying micro surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the micro surfacing by a suitable method. The B.A.R. shall approve the surface preparation prior to surfacing.

10.2 TACK COAT

Normally, tack coat is not required unless the surface to be covered is extremely dry and raveled or is concrete or brick. If required, the emulsified asphalt should be SS, CSS, or the micro surfacing emulsion. Consult with the micro surfacing emulsion supplier to determine dilution stability. The tack coat may consist of one part emulsified asphalt/three parts water and should be applied with a standard distributor. The distributor shall be capable of applying the dilution evenly at a rate of 0.05-0.15 gal/yd^2 (0.23-0.68 l/m^2). The tack coat shall be allowed to cure sufficiently before the application of micro surfacing. If a tack coat is to be required, it must be noted in the project plans.

10.3 CRACKS

It is recommended to treat cracks wider than 0.25" (0.64cm) in the pavement surface with an approved crack sealer prior to application of the slurry seal.

11. APPLICATION

11.1 GENERAL

If required, a test strip should be placed in conditions similar to those expected to be encountered during the project.

When local conditions warrant, the surface shall be fogged with water ahead of the spreader box. The rate of application of the fog spray may be adjusted as the temperature, surface texture, humidity, and dryness of the pavement change.
The micro surfacing shall be of the appropriate consistency upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that complete coverage is obtained. Overloading of the spreader box shall be avoided. No lumps or unmixed aggregate shall be permitted. No dry aggregate either spilled from the lay-down machine or existing on the road, will be permitted.

No streaks, such as those caused by oversized aggregate or broken mix, shall be left in the finished surface. If excessive streaking develops, the job will be stopped until the contractor proves to the B.A.R. that the situation has been corrected. Excessive streaking is defined as more than four drag marks greater than 0.5 in (12.7 mm) wide and 4.0 in (101 mm) long, or 1.0 in (25.4 mm) wide and 3.0 in (76.2 mm) long, in any 29.9 yd^2 (25 m^2) area. No transverse ripples or longitudinal streaks of 0.25 in (6.4 mm) in depth will be permitted, when measured by placing a 10 ft (3 m) straight edge over the surface.

11.2 RATE OF APPLICATION

The micro surfacing mixture shall be of the proper consistency at all times so as to provide the application rate required by the surface condition. The application rate shall be in accordance with the table below.

AGGREGATE TYPE	LOCATION	SUGGESTED APPLICATION RATE
Type II	Urban and Residential Streets Airport Runways Scratch or Leveling Course	10 - 20 lb/yd^2 (5.4 - 10.8 kg/m^2) As Required
Type III	Primary and Interstate Routes Wheel Ruts Scratch or Leveling Course	15 - 30 lb/yd^2 (8.1 - 16.3 kg/m^2) As Required (See Appendix B) As Required

Suggested application rates are based upon the weight of dry aggregate in the mixture. Application rates are affected by the unit weight and gradation of the aggregate and the demand of the surface to which the micro surfacing is being applied.

11.3 JOINTS

No excess buildup, uncovered areas, or unsightly appearance shall be permitted on longitudinal or transverse joints. The contractor shall provide suitable width spreading equipment to produce a minimum number of longitudinal joints throughout the project. When possible, longitudinal joints shall be placed on lane lines. Partial width passes will only be used when necessary and shall not be the last pass of any paved area. A maximum of 3.0 in (76.2 mm) shall be allowed for overlap of longitudinal joints. Also, the joint shall

have no more than a 0.25 in (6.4 mm) difference in elevation when measured by placing a 10 ft (3 m) straight edge over the joint and measuring the elevation difference.

11.4 MIXTURE

The micro surfacing shall possess sufficient stability so that premature breaking of the material in the spreader box does not occur. The mixture shall be homogeneous during and following mixing and spreading. It shall be free of excess liquids which create segregation of the aggregate. Spraying of additional water into the spreader box will not be permitted.

11.5 HANDWORK

Areas which cannot be accessed by the mixing machine shall be surfaced using hand squeegees to provide complete and uniform coverage. If necessary, the area to be hand worked shall be lightly dampened prior to mix placement. As much as possible, handwork shall exhibit the same finish as that applied by the spreader box. All handwork shall be completed prior to final surfacing.

11.6 LINES

Lines at intersections, curbs, and shoulders will be kept straight to provide a good appearance. If necessary, a suitable material will be used to mask off the end of streets to provide straight lines. Longitudinal edge lines shall not vary by more than ± 2 in (± 51 mm) horizontal variance in any 96 ft (29 m) of length.

11.7 ROLLING

Rolling is usually not necessary for micro surfacing on roadways. Airports and parking areas should be rolled by a self-propelled, 10-ton (maximum) pneumatic tire roller equipped with a water spray system. All tires should be inflated per manufacturer's specifications. Rolling shall not start until the micro surfacing has cured sufficiently to avoid damage by the roller. Areas which require rolling shall receive a minimum of two (2) full coverage passes.

11.8 CLEAN UP

All utility access areas, gutters and intersections, shall have the micro surfacing removed as specified by the B.A.R. The contractor shall remove any debris associated with the performance of the work on a daily basis.

12. QUALITY CONTROL

12.1 INSPECTION

Inspectors assigned to projects must be familiar with the materials, equipment and application of micro surfacing. Local conditions and specific project requirements should be considered when determining the parameters of field inspection.

Proper mix consistency should be one of the major areas of inspector concern. If mixes are too dry, streaking, lumping and roughness will be present in the mat surface. Mixes applied too wet will flow excessively and not hold straight lane lines. Excessive liquids may also cause an asphalt-rich surface with segregation.

12.2 MATERIALS

To account for aggregate bulking, it is the responsibility of the contractor to check stockpile moisture content and to set the machine accordingly. At the B.A.R.'s discretion, material tests may be run on representative samples of the aggregate and emulsion. Tests will be run at the expense of the buyer. The buyer must notify the contractor immediately if any test fails to meet the specifications.

12.3 MICRO SURFACING

If required, representative samples of the micro surfacing may be taken directly from the micro surfacing machine. Residual asphalt content (ASTM D2172) tests may be run on the samples at the expense of the buyer. The buyer must notify the contractor immediately if any test fails to meet specifications. Data obtained from the proportioning devices on the micro surfacing machine may be used to determine individual material quantities and application rate.

12.4 NON-COMPLIANCE

If any two successive tests fail on the stockpile aggregate, the job shall be stopped. If any two successive tests on the mix from the same machine fail, the use of the machine shall be suspended. It will be the responsibility of the contractor, at his expense, to prove to the B.A.R. that the problems have been corrected.

13. METHOD OF MEASUREMENT

13.1 AREA

On smaller projects, the method of measurement and payment is usually based on the area covered, measured in square feet, square yards, or square meters.

13.2 TONS AND GALLONS

On larger projects of over 50,000 yd^2 (41,806 m^2) measurement and payment are usually based on the tons of aggregate and the gallons (liters) of emulsified asphalt used.

Aggregate delivery tickets or printed tickets from certified scales at the staging area shall be used for measurement. The emulsified asphalt used on the project will be measured by the certified tickets for each load delivered. Emulsified asphalt not used shall be deducted from the job total.

14. PAYMENT

The micro surfacing shall be paid for by the unit area or the weight of the aggregate and the emulsified asphalt used on the project and accepted by the B.A.R. Payment shall be full compensation for all preparation, mixing and application of materials, and for all labor, equipment, tools, testing, cleaning, and incidentals necessary to complete the job as specified herein.

APPENDIX A
AGENCIES

AGENCIES

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

TEST METHODS

EMULSIFIED ASPHALT

AASHTO TEST NO.	ASTM TEST NO.	TEST
M 208	D 2397	Specification for Cationic Emulsified Asphalt
T 59	D 6930	Settlement and Storage Stability of Emulsified Asphalts
T 59	D 6997	Distillation of Emulsified Asphalt (This test method may have to be modified by using lower temperatures.)
T 40	D 140	Sampling Bituminous Materials
T 59	D 244	Test Methods and Practices for Emulsified Asphalts

RESIDUE FROM EMULSIFIED ASPHALT

AASHTO TEST NO.	ASTM TEST NO.	TEST
T 53	D 36	Softening Point of Bitumen (Ring-and-Ball Apparatus)
T 49	D 5	Penetration of Bituminous Materials

APPENDIX A

TEST METHODS (CONTINUED)

AGGREGATE AND MINERAL FILLER

AASHTO TEST NO.	ASTM TEST NO.	TEST
T 176	D 2419	Sand Equivalent Value of Soils and Fine Aggregate
T 104	C 88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
T 96	C 131	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine (This test should be performed on the parent rock that is used for crushing the finer gradation Micro Surfacing material.)
T 27	C 136	Sieve Analysis of Fine and Coarse Aggregates
T 11	C 117	Test Method for Materials Finer than 75µm (No. 200) Sieve in Mineral Aggregates by Washing
T 2	D 75	Sampling Aggregates
	D 242	Mineral Filler for Bituminous Paving Mixtures
T 19	C 29	Bulk Density ("Unit Weight") and Voids in Aggregate

MIX DESIGN

ISSA TEST NO.	TEST
A143	Standard Design, Testing and Construction of Micro Surfacing
TB 100	Wet Track Abrasion of Slurry Seals
TB 109	Excess Asphalt by LWT Sand Adhesion
TB 113	Mix Time
TB 114	Wet Stripping Test for Cured Slurry Seal Mixes
TB 136	Causes of Inconsistency of Wet Track Abrasion Test (WTAT) Results
TB 144	Classification Compatibility by Use of the Schulze-Breuer and Ruck Procedure
TB 147	Measurement of Stability and Resistance to Compaction, Vertical and Lateral Displacement of Multilayered Fine Aggregate Cold Mixes

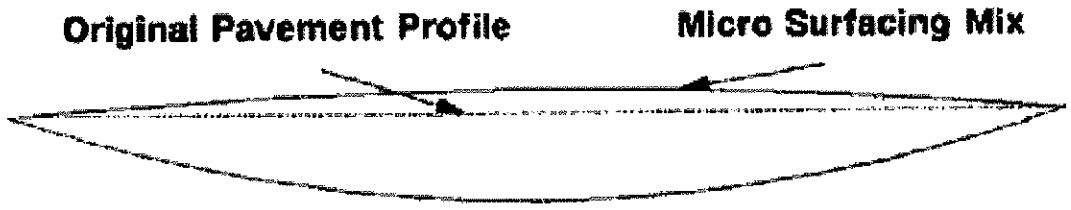
NOTES:
ASTM D 6372, Standard Practice for Design, Testing, and Construction of Micro Surfacing, is a combined reference of the ISSA Test Bulletins listed above.

ASTM D 2172, Standard Test Methods for Quantitative Extraction of Bitumem From Bituminous Paving Mixtures, is referenced in Section 12.3.

APPENDIX B
REPROFILING RUTTED WHEELPATHS WITH MICRO SURFACING

Rule of Thumb

For every inch (mm) of micro surfacing mix, add 0.125 in (3.2 mm) to 0.25 in (6.4 mm) as a crown to allow for compaction under traffic.



Rut in Wheelpath

Rut Depth		Micro Surfacing Quantity Needed	
0.5 - 0.75"	(12.7 - 19.1 mm)	20 - 30 lb/yd^2	(10.8 - 16.3 kg/m^2)
0.75 - 1.00"	(19.1 - 25.4 mm)	25 - 35 lb/yd^2	(13.6 - 19.0 kg/m^2)
1.00 - 1.25"	(25.4 - 31.75 mm)	28 - 38 lb/yd^2	(15.2 - 20.6 kg/m^2)
1.25 - 1.50"	(31.75 - 38.1 mm)	32 - 40 lb/yd^2	(17.4 - 21.7 kg/m^2)

Notes:

Notes:

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