



LEXINGTON

Bid 52-2023
Pavement Technology Inc.
Pavement Technology Inc.
Supplier Response

Event Information

Number: Bid 52-2023
Title: Asphalt Rejuvenation
Type: Competitive Bid
Issue Date: 4/27/2023
Deadline: 5/18/2023 02:00 PM (ET)
Notes: Please submit bid in one pdf.

Contact Information

Contact: Sondra Stone
Address: Central Purchasing
Government Center Building
200 East Main Street
Lexington, KY 40507
Phone: (859) 2583320
Fax: (859) 2583322
Email: ssone@lexingtonky.gov

Pavement Technology Inc. Information

Contact: Debbie Cancelliere
Address: 24144 Detroit Road
Westlake
Westlake, OH 44145
Phone: (440) 892-1895
Fax: (440) 892-0953
Toll Free: (800) 333-6309
Email: dcancelliere@pavetechinc.com
Web Address: <http://www.pavetechinc.com>

ONLY ONLINE BIDS WILL BE ACCEPTED! By submitting your response, you certify that you are authorized to represent and bind your company and that you agree to all bid terms and conditions as stated in the attached bid/RFP/RFQ/Quote/Auction documents.

Susan Durante

Signature

Submitted at 5/16/2023 04:18:25 PM (ET)

dcancelliere@pavetechinc.com

Email

Response Attachments

ITB #52-2023.pdf

ITB 52-2023 Bid Submission - PTI

PAVEMENT TECHNOLOGY INC.

24144 DETROIT ROAD
WESTLAKE, OHIO 44145
(440) 892-1895
(800) 333-6309
FAX (440) 892-0953

Asphalt Recycling & Preventive Maintenance Specialists

May 15, 2023

Ms. Sherita Miller
Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507

RE: ITB #52-2023 Asphalt Rejuvenation

Dear Ms. Miller,

Thank you for the opportunity afforded us to bid on project #52-2023 Asphalt Rejuvenation. Pavement Technology, Inc. is a specialized company with 50 years of experience in the application of Reclamite[®] Asphalt Rejuvenator. Per said project bid specifications and quantities, our firm will be able to perform all of the work, complete in place, and will not require contracting with sub-contractors. Pavement Technology, Inc. in "Good Faith Effort" will always try to meet the recommended goals, where applicable.

The alternate bid offered by Pavement Technology, Inc. for Asphalt Rejuvenating Service differs from the Base Bid only to the extent that the additional feature of exhaust emission reduction is included in the process. The A.R.A.-1 Ti[®] contains the same maltene fractions of which the Reclamite[®] material is comprised. The included test data confirms that the A.R.A.-1 Ti[®] reduces the asphalt binder viscosity to the same extent that Reclamite[®] exhibits.

The added benefit of the addition of Titanium Dioxide (TiO₂) is the ability of this material to serve as a catalyst in the oxidation of nitrous oxides (NO₂) or exhaust gases from gas and diesel powered vehicles. As a catalyst the TiO₂ is not exhausted in the process and as such is always available for additional and continuous chemical reaction. The ability of the carrier liquid to penetrate into the pavement matrix to one quarter inch or more insures that TiO₂ will surface should the pavement be subjected to abrasive traffic ware.

The inclusion of excerpts from studies conducted at Louisiana State University and Iowa State University underscore the validity of Titanium Dioxide's ability to reduce vehicle exhaust gas to a harmless inert material.

Should the Alternate Bid be of interest, additional research data will be furnished.

The contact person for this solicitation is Debbie Cancelliere, who may be reached at the phone number above or by email at dcancelliere@pavetechinc.com.

Respectfully Submitted,

Susan J. Durante

Susan J. Durante
EEOC Officer



LEXINGTON

Lexington-Fayette Urban County Government

Lexington, Kentucky
Horse Capital of the World

Division of Central Purchasing

Date of Issue: Apr 27, 2023

INVITATION TO BID #52-2023

Bid Opening Date: May 18, 2023

Bid Opening Time: 2:00 PM

Address: All bids must be submitted on line at <https://lexingtonky.ionwave.net/>

Type of Bid: Price Contract

Pre Bid Meeting: N/A

Pre Bid Time: N/A

Address: N/A

Sealed bids will ONLY be received online at <https://lexingtonky.ionwave.net/> until **2:00 PM**, prevailing local time on **05/18/2023**. Bids must be submitted/uploaded by the above-mentioned date and time.

Bids are to include all shipping, handling and associated fees to the point of delivery (unless otherwise specified in the bid documents below) located at: Lexington, KY

<p style="text-align: center;">Check One:</p> <p><input checked="" type="checkbox"/> Bid Specifications Met _____ Exceptions to Bid Specifications. <i>Exceptions shall be itemized and attached to bid proposal submitted.</i></p>	<p style="text-align: center;">Proposed Delivery:</p> <p style="text-align: center;">15 days after acceptance of bid.</p>
<p>Procurement Card Usage—The Lexington-Fayette Urban County Government may be using Procurement Cards to purchase goods and services and also to make payments. Will you accept Procurement Cards? _____ Yes <input checked="" type="checkbox"/> No</p>	

To expedite award, the forms in this document should be completed and uploaded with your bid.

Submitted by: Pavement Technology, Inc.

Firm Name

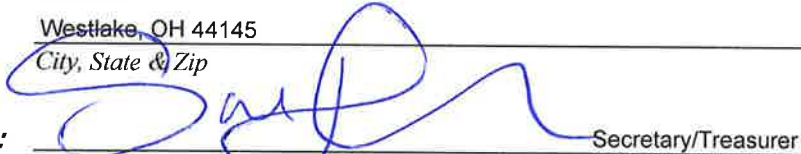
24144 Detroit Road

Address

Westlake, OH 44145

City, State & Zip

Bid must be signed:



Secretary/Treasurer

Signature of Authorized Company Representative – Title

Susan Durante

Representative's Name (Typed or printed)

440-892-1895

440-8920953

Area Code - Phone – Extension

Fax #

dcancelliere@pavetechinc.com

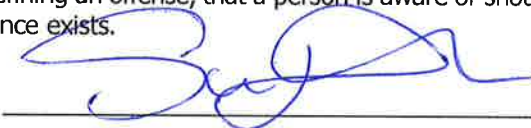
E-Mail Address

The Affidavit in this bid must be completed before your firm can be considered for award of this contract.

AFFIDAVIT

Comes the Affiant, Susan Durante, and after being first duly sworn under penalty of perjury as follows:

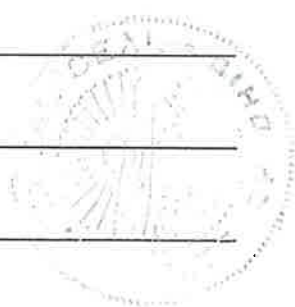
1. His her name is Susan Durante and he she is the individual submitting the bid or is the authorized representative of Pavement Technology, Inc. the entity submitting the bid (hereinafter referred to as "Bidder")
2. Bidder will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the bid is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.
3. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.
4. Bidder has authorized the Division of Central Purchasing to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.
5. Bidder has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky within the past five (5) years and the award of a contract to the Bidder will not violate any provision of the campaign finance laws of the Commonwealth.
6. Bidder has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as "Ethics Act."
7. Bidder acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

Further, Affiant sayeth naught. 

STATE OF Ohio

COUNTY OF Cuyahoga

The foregoing instrument was subscribed, sworn to and acknowledged before me by Susan Durante on this the 16th day of May, 2023



My Commission expires: Elizabeth Malcomby
Notary Public, State of Ohio
My Commission Expires: February 27, 2025


NOTARY PUBLIC, STATE AT LARGE

Please refer to Section II. Bid Conditions, Item "U" prior to completing this form.

I. GREEN PROCUREMENT

A. ENERGY

The Lexington-Fayette Urban County Government is committed to protecting our environment and being fiscally responsible to our citizens.

The Lexington-Fayette Urban County Government mandates the use of Energy Star compliant products if they are available in the marketplace (go to www.Energystar.gov). If these products are available, but not submitted in your pricing, your bid will be rejected as non-compliant.

ENERGY STAR is a government program that offers businesses and consumers energy-efficient solutions, making it easy to save money while protecting the environment for future generations.

Key Benefits

These products use 25 to 50% less energy
Reduced energy costs without compromising quality or performance
Reduced air pollution because fewer fossil fuels are burned
Significant return on investment
Extended product life and decreased maintenance

B. GREEN SEAL CERTIFIED PRODUCTS

The Lexington-Fayette Urban County Government is also committed to using other environmentally friendly products that do not negatively impact our environment. Green Seal is a non-profit organization devoted to environmental standard setting, product certification, and public education.

Go to www.Greenseal.org to find available certified products. These products will have a reduced impact on the environment and on human health. The products to be used must be pre-approved by the LFUCG prior to commencement of any work in any LFUCG facility. If a Green Seal product is not available, the LFUCG must provide a signed waiver to use an alternate product. Please provide information on the Green Seal products being used with your bid response.

C. GREEN COMMUNITY

The Lexington-Fayette Urban County Government (LFUCG) serves as a principal, along with the University of Kentucky and Fayette County Public Schools, in the Bluegrass Partnership for a Green Community. The Purchasing Team component of the Partnership collaborates on economy of scale purchasing that promotes and enhances environmental initiatives. Specifically, when applicable, each principal is interested in obtaining best value products and/or services which promote environment initiatives via solicitations and awards from the other principals.

If your company is the successful bidder on this Invitation For Bid, do you agree to extend the same product/service pricing to the other principals of the Bluegrass Partnership for a Green Community (i.e. University of Kentucky and Fayette County Schools) if requested?

Yes X No

II. Bid Conditions

- A. No bid may be withdrawn for a period of sixty (60) days after the date and time set for opening.
- B. No bid may be altered after the date and time set for opening. In the case of obvious errors, the Division of Central Purchasing may permit the withdrawal of a bid. The decision as to whether a bid may be withdrawn shall be that of the Division of Central Purchasing.
- C. Acceptance of this proposal shall be enactment of an Ordinance by the Urban County Council.
- D. The bidder agrees that the Urban County Government reserves the right to reject any and all bids for either fiscal

or technical reasons, and to award each part of the bid separately, all parts to one vendor or all parts to multiple vendors.

- E. Minor exceptions may not eliminate the bidder. The decision as to whether any exception is minor shall be entirely that of the head of the requisitioning Department or Division and the Director of the Division of Central Purchasing. The Urban County Government may waive technicalities and informalities where such waiver would best serve the interests of the Urban County Government.
- F. Manufacturer's catalogue numbers, trade names, etc., where shown herein are for descriptive purposes and are to guide the bidder in interpreting the standard of quality, design, and performance desired, and shall not be construed to exclude proposals based on furnishing other types of materials and/or services. However, any substitution or departure proposed by the bidder must be clearly noted and described; otherwise, it will be assumed that the bidder intends to supply items specifically mentioned in this Invitation for Bids.
- G. The Urban County Government may require demonstrations of the materials proposed herein prior to acceptance of this proposal.
- H. Bids must be submitted on this form and must be signed by the bidder or his authorized representative. Unsigned bids will not be considered.
- I. Bids must be submitted prior to the date and time indicated for opening. Bids submitted after this time will not be considered.
- J. All bids mailed must be submitted in the Ion Wave online portal at <https://lexingtonky.ionwave.net/>
- K. Bidder is requested to show both unit prices and lot prices. In the event of error, the unit price shall prevail.
- L. A certified check or Bid Bond in the amount of XX percent of the bid price must be attached hereto. This check must be made payable to the Lexington-Fayette Urban County Government, and will be returned when the material and/or services specified herein have been delivered in accordance with specifications. In the event of failure to perform within the time period set forth in this bid, it is agreed the certified check may be cashed and the funds retained by the Lexington-Fayette Urban County Government as liquidated damages. Checks of unsuccessful bidders will be returned when the bid has been awarded.
- M. The delivery dates specified by bidder may be a factor in the determination of the successful bidder.
- N. Tabulations of bids received may be mailed to bidders. Bidders requesting tabulations must enclose a stamped, self-addressed envelope with the bid.
- O. The Lexington-Fayette Urban County Government is exempt from Kentucky Sales Tax and Federal Excise Tax on materials purchased from this bid invitation. Materials purchased by the bidder for construction projects are not tax exempt and are the sole responsibility of the bidder.
- P. All material furnished hereunder must be in full compliance with OSHA regulations.
- Q. If more than one bid is offered by one party, or by any person or persons representing a party, all such bids shall be rejected.
- R. Signature on the face of this bid by the Bidder or his authorized representative shall be construed as acceptance of and compliance with all terms and conditions contained herein.
- S. The Entity (regardless of whether construction contractor, non-construction contractor or supplier) agrees to provide equal opportunity in employment for all qualified persons, to prohibit discrimination in employment because of race, color, religion, sex (including pregnancy, sexual orientation or gender identity), national origin, disability, age, genetic information, political affiliation, or veteran status, and to promote equal employment through a positive, continuing program from itself and each of its sub-contracting agents. This program of equal employment opportunity shall apply to every aspect of its employment policies and practices.
- T. The Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any county, city, town, school district, water district, hospital district, or other political subdivision of the state shall include in directly

or indirectly publicly funded contracts for supplies, materials, services, or equipment hereinafter entered into the following provisions:

During the performance of this contract, the contractor agrees as follows:

- (1) *The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age or national origin;*
- (2) *The contractor will state in all solicitations or advertisements for employees placed by or on behalf of the contractors that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age or national origin;*
- (3) *The contractor will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provisions of the non-discrimination clauses required by this section; and*
- (4) *The contractor will send a notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding advising the labor union or workers' representative of the contractor's commitments under the nondiscrimination clauses.*

The Act further provides:

KRS 45.610. Hiring minorities - Information required

- (1) *For the length of the contract, each contractor shall hire minorities from other sources within the drawing area, should the union with which he has collective bargaining agreements be unwilling to supply sufficient minorities to satisfy the agreed upon goals and timetable.*
- (2) *Each contractor shall, for the length of the contract, furnish such information as required by KRS 45.560 to KRS 45.640 and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with KRS 45.560 to 45.640 and such rules, regulations and orders issued pursuant thereto.*

KRS 45.620. Action against contractor - Hiring of minority contractor or subcontractor

- (1) *If any contractor is found by the department to have engaged in an unlawful practice under this chapter during the course of performing under a contract or subcontract covered under KRS 45.560 to 45.640, the department shall so certify to the contracting agency and such certification shall be binding upon the contracting agency unless it is reversed in the course of judicial review.*
- (2) *If the contractor is found to have committed an unlawful practice under KRS 45.560 to 45.640, the contracting agency may cancel or terminate the contract, conditioned upon a program for future compliance approved by the contracting agency and the department. The contracting agency may declare such a contractor ineligible to bid on further contracts with that agency until such time as the contractor complies in full with the requirements of KRS 45.560 to 45.640.*
- (3) *The equal employment provisions of KRS 45.560 to 45.640 may be met in part by a contractor by subcontracting to a minority contractor or subcontractor. For the provisions of KRS 45.560 to 45.640, a minority contractor or subcontractor shall mean a business that is owned and controlled by one or more persons disadvantaged by racial or ethnic circumstances.*

KRS 45.630 Termination of existing employee not required, when

Any provision of KRS 45.560 to 45.640 notwithstanding, no contractor shall be required to terminate an existing employee upon proof that that employee was employed prior to the date of the contract.

KRS 45.640 Minimum skills

Nothing in KRS 45.560 to 45.640 shall require a contractor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

It is recommended that all of the provisions above quoted to be included as special conditions in each contract.

In the case of a contract exceeding \$250,000, the contractor is required to furnish evidence that his work-force in Kentucky is representative of the available work-force in the area from which he draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the contract.

- U. Any party, firm or individual submitting a proposal pursuant to this invitation must be in compliance with the requirements of the Lexington-Fayette Urban County Government regarding taxes and fees before they can be considered for award of this invitation and must maintain a "current" status with regard to those taxes and fees throughout the term of the contract. The contractor must be in compliance with Chapter 13 from the Code of Ordinances of the Lexington-Fayette Urban County Government. The contractor must be in compliance with Ordinance 35-2000 pursuant to contractor registration with the Division of Building Inspection. If applicable, said business must have a Fayette County business license.

Pursuant to KRS 45A.343 and KRS 45A.345, the contractor shall

- (1) *Reveal any final determination of a violation by the contractor within the previous five year period pursuant to KRS Chapters 136 (corporation and utility taxes), 139 (sales and use taxes), 141 (income taxes), 337 (wages and hours), 338 (occupational safety and health of employees), 341 (unemployment and compensation) and 342 (labor and human rights) that apply to the contractor; and*
- (2) *Be in continuous compliance with the above-mentioned KRS provisions that apply to the contractor for the duration of the contract.*

A contractor's failure to reveal the above or to comply with such provisions for the duration of the contract shall be grounds for cancellation of the contract and disqualification of the contractor from eligibility for future contracts for a period of two (2) years.

- V. Vendors who respond to this invitation have the right to file a notice of contention associated with the bid process or to file a notice of appeal of the recommendation made by the Director of Central Purchasing resulting from this invitation.

Notice of contention with the bid process must be filed within 3 business days of the bid/proposal opening by (1) sending a written notice, including sufficient documentation to support contention, to the Director of the Division of Central Purchasing or (2) submitting a written request for a meeting with the Director of Central Purchasing to explain his/her contention with the bid process. After consulting with the Commissioner of Finance the Chief Administrative Officer and reviewing the documentation and/or hearing the vendor, the Director of Central Purchasing shall promptly respond in writing findings as to the compliance with bid processes. If, based on this review, a bid process irregularity is deemed to have occurred the Director of Central Purchasing will consult with the Commissioner of Finance, the Chief Administrative Officer and the Department of Law as to the appropriate remedy.

Notice of appeal of a bid recommendation must be filed within 3 business days of the bid recommendation by (1) sending a written notice, including sufficient documentation to support appeal, to the Director, Division of Central Purchasing or (2) submitting a written request for a meeting with the Director of Central Purchasing to explain his appeal. After reviewing the documentation and/or hearing the vendor and consulting with the Commissioner of Finance and the Chief Administrative Officer, the Director of Central Purchasing shall in writing, affirm or withdraw the recommendation.

III. Procurement Contract Bid Conditions

- A. The terms of this agreement shall be for 1 year(s) from the date of acceptance of this contract by the Lexington-Fayette Urban County Government. This agreement may be automatically extended for an additional 1 year(s) renewal. This contract may be canceled by either party thirty (30) days after delivery by canceling party of written notice of intent to cancel to the other contracting party.

- B. Price Changes (**Space Checked Applies**)
 - (1). Prices quoted in response to the Invitation shall be firm prices for the first 365 days of the Procurement Contract. After 365 days, prices may be subject to revision and such changes shall be based on general industry changes. Revision may be either increases or decreases and may be requested by either party. There will be no more than one (1) price adjustment per year. Requests for price changes shall be received in writing at least twenty (20) days prior to the effective date and are subject to written acceptance before becoming effective. Proof of the validity of a request for revision shall be responsibility of the requesting party. The Lexington-Fayette Urban County Government shall receive the benefit of any decline that the seller shall offer his other accounts.

 - (XXX) 2. No provision for price change is made herein. Prices are to be firm for the term of this contract.

 - () 3. See bid specifications.

- C. If any contract item is not available from the vendor, the Lexington-Fayette Urban County Government, at its option, may permit the item to be back-ordered or may procure the item on the open market.

- D. All invoices must bear reference to the Lexington-Fayette Urban County Government Purchasing document numbers which are being billed.

- E. This contract may be canceled by the Lexington-Fayette Urban County Government if it is determined that the Bidder has failed to perform under the terms of this agreement, such cancellation to be effective upon receipt of written notice of cancellation by the Bidder.

- F. No substitutions for articles specified herein may be made without prior approval of the Division of Central Purchasing.

EQUAL OPPORTUNITY AGREEMENT

Standard Title VI Assurance

The Lexington Fayette-Urban County Government, (hereinafter referred to as the "Recipient") hereby agrees that as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78Stat.252, 42 U.S.C. 2000d-4 (hereinafter referred to as the "Act"), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, (49 CFR, Part 21) Nondiscrimination in Federally Assisted Program of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the "Regulations") and other pertinent directives, no person in the United States shall, on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the U.S. Department of Transportation, including the Federal Highway Administration, and hereby gives assurance that will promptly take any necessary measures to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

The Law

- Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.
- Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and sub-contractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.
- Section 503 of the Rehabilitation Act of 1973 states: *The Contractor will not discriminate against any employee or applicant for employment because of physical or mental disability.*
- Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal contracts.
- Section 206(A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states: *The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.*

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors and all supervisory personnel. In following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractors may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, veteran status, disability and age.

Signature

Susan Durante, Secretary/Treasurer

Pavement Technology, Inc.

Name of Business

GENERAL PROVISIONS OF BID CONTRACT

By signing the below, bidder acknowledges that it understands and agrees with the following provisions related to its bid response and the provision of any goods or services to LFUCG upon selection by LFUCG pursuant to the bid request:

1. Bidder shall comply with all Federal, State & Local regulations concerning this type of service or good. All applicable state laws, ordinances and resolutions (including but not limited to Section 2-33 (Discrimination due to sexual orientation or gender identity) and Chapter 13 (Licenses and Regulations) of the Lexington-Fayette Urban County Government Code of Ordinances, and Resolution No. 484-17 (Minority, Women, and Veteran-Owned Businesses)) and the regulations of all authorities having jurisdiction over the project shall apply to the contract, and shall be deemed to be incorporated herein by reference.
2. Failure to submit ALL forms and information required by LFUCG may be grounds for disqualification.
3. Addenda: All addenda and IonWave Q&A, if any, must be considered by the bidder in making its response, and such addenda shall be made a part of the requirements of the bid contract. Before submitting a bid response, it is incumbent upon bidder to be informed as to whether any addenda have been issued, and the failure of the bidder to cover any such addenda may result in disqualification of that response.
4. Bid Reservations: LFUCG reserves the right to reject any or all bid responses, to award in whole or part, and to waive minor immaterial defects in proposals. LFUCG may consider any alternative proposal that meets its basic needs.
5. Liability: LFUCG is not responsible for any cost incurred by bidder in the preparation of its response.
6. Changes/Alterations: Bidder may change or withdraw a proposal at any time prior to the opening; however, no oral modifications will be allowed. Only letters, or other formal written requests for modifications or corrections of a previously submitted proposal which is addressed in the same manner as the bid response, and received by LFUCG prior to the scheduled closing time for receipt of bids, will be accepted. The bid response when opened, will then be corrected in accordance with such written request(s), provided that the written request is contained in a sealed envelope which is plainly marked "modifications of bid response".
7. Clarification of Submittal: LFUCG reserves the right to obtain clarification of any point in a bid or to obtain additional information from any bidder.
8. Bribery Clause: By his/her signature on its response, bidder certifies that no employee of his/hers, any affiliate or subcontractor, has bribed or attempted to bribe an officer or employee of the LFUCG.
9. Additional Information: While not necessary, the bidder may include any product brochures, software documentation, sample reports, or other documentation that may assist LFUCG in better understanding and evaluating the bid response. Additional documentation shall not serve as a substitute for other documentation which is required by the LFUCG to be submitted with the bid response.
10. Ambiguity, Conflict or other Errors: If a bidder discovers any ambiguity, conflict, discrepancy, omission or other error in the bid request of LFUCG, it shall immediately notify LFUCG of such error in writing and request modification or clarification of the document if allowable by the LFUCG.
11. Agreement to Bid Terms: In submitting its bid response, the bidder agrees that it has carefully examined the specifications and all provisions relating to LFUCG's bid request, including but not limited to the bid contract. By submission of its bid response, bidder states that it understands the meaning, intent and requirements of LFUCG's bid request and agrees to the same. The successful bidder shall warrant that it is familiar with and understands all provisions herein and shall warrant that it can comply with them. No additional compensation to bidder shall be authorized for services, expenses, or goods reasonably covered under these provisions that the bidder omits from its bid response.
12. Cancellation: LFUCG may unilaterally terminate the bid contract with the selected bidder(s) at any time, with or without cause, by providing at least thirty (30) days advance written notice unless a different advance written notice

period is negotiated prior to contract approval. Payment for services or goods received prior to termination shall be made by the LFUCG provided these goods or services were provided in a manner acceptable to the LFUCG. Payment for those goods and services shall not be unreasonably withheld.

13. Assignment of Contract: The selected bidder(s) shall not assign or subcontract any portion of the bid contract with LFUCG without the express written consent of LFUCG. Any purported assignment or subcontract in violation hereof shall be void. It is expressly acknowledged that LFUCG shall never be required or obligated to consent to any request for assignment or subcontract; and further that such refusal to consent can be for any or no reason, fully within the sole discretion of LFUCG.
14. No Waiver: No failure or delay by LFUCG in exercising any right, remedy, power or privilege hereunder, nor any single or partial exercise thereof, nor the exercise of any other right, remedy, power or privilege shall operate as a waiver hereof or thereof. No failure or delay by LFUCG in exercising any right, remedy, power or privilege under or in respect of this bid proposal or bid contract shall affect the rights, remedies, powers or privileges of LFUCG hereunder or shall operate as a waiver thereof.
15. Authority to do Business: Each bidder must be authorized to do business under the laws of the Commonwealth of Kentucky and must be in good standing and have full legal capacity to provide the goods or services specified in the bid proposal. Each bidder must have all necessary right and lawful authority to submit the bid response and enter into the bid contract for the full term hereof including any necessary corporate or other action authorizing the bidder to submit the bid response and enter into this bid contract. If requested, the bidder will provide LFUCG with a copy of a corporate resolution authorizing this action and/or a letter from an attorney confirming that the proposer is authorized to do business in the Commonwealth of Kentucky. All bid responses must be signed by a duly authorized officer, agent or employee of the bidder.
16. Governing Law: This bid request and bid contract shall be governed by and construed in accordance with the laws of the Commonwealth of Kentucky. In the event of any proceedings regarding this matter, the bidder agrees that the venue shall be the Fayette County Circuit Court or the U.S. District Court for the Eastern District of Kentucky, Lexington Division and that the bidder expressly consents to personal jurisdiction and venue in such Court for the limited and sole purpose of proceedings relating to these matters or any rights or obligations arising thereunder.
17. Ability to Meet Obligations: Bidder affirmatively states that there are no actions, suits or proceedings of any kind pending against bidder or, to the knowledge of the bidder, threatened against the bidder before or by any court, governmental body or agency or other tribunal or authority which would, if adversely determined, have a materially adverse effect on the authority or ability of bidder to perform its obligations under this bid response or bid contract, or which question the legality, validity or enforceability hereof or thereof.
18. Price Discrepancy: When applicable, in case of price discrepancy, unit bid price written in words will prevail followed by unit price written in numbers then total amount bid per line item.
19. Bidder understands and agrees that its employees, agents, or subcontractors are not employees of LFUCG for any purpose whatsoever. Bidder is an independent contractor at all times related to the bid response or bid contract.
20. Contractor [or Vendor or Vendor's Employees] will not appropriate or make use of the Lexington-Fayette Urban County Government (LFUCG) name or any of its trade or service marks or property (including but not limited to any logo or seal), in any promotion, endorsement, advertisement, testimonial or similar use without the prior written consent of the government. If such consent is granted LFUCG reserves the unilateral right, in its sole discretion, to immediately terminate and revoke such use for any reason whatsoever. Contractor agrees that it shall cease and desist from any unauthorized use immediately upon being notified by LFUCG.
21. If any term or provision of this bid contract shall be found to be illegal or unenforceable, the remainder of the contract shall remain in full force and such term or provision shall be deemed stricken.


Signature Susan Durante, Secretary/Treasurer

5/16/23

Date

WORKFORCE ANALYSIS FORM

Name of Organization: Pavement Technology, Inc.

Categories	Total	White (Not Hispanic or Latino)		Hispanic or Latino		Black or African-American (Not Hispanic or Latino)		Native Hawaiian and Other Pacific Islander (Not Hispanic or Latino)		Asian (Not Hispanic or Latino)		American Indian or Alaskan Native (not Hispanic or Latino)		Two or more races (Not Hispanic or Latino)		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators																	
Professionals	4	3	1													3	1
Superintendents																	
Supervisors	13	8	1			4										12	1
Foremen																	
Technicians																	
Protective Service																	
Para-Professionals	4	4														4	
Office/Clerical	6		6														6
Skilled Craft	30	10		2		11	4			3						26	4
Service/Maintenance	7	2			1	4										6	1
Total:	64	27	8	2	1	19	4			3						51	13

Prepared by: Susan Durante, Secretary/Treasurer Date: 5 / 15 / 2023
 (Name and Title) Revised 2015-Dec-15

**DIRECTOR, DIVISION OF CENTRAL PURCHASING
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 EAST MAIN STREET
LEXINGTON, KENTUCKY 40507**

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITIES AND DBE CONTRACT PARTICIPATION**

The Lexington-Fayette Urban County Government has set a goal that not less than ten percent (10%) of the total value of this contract be subcontracted to MBE/WBE's, and set a goal that not less than three percent (3%) of the total value of this contract be subcontracted to Veteran-Owned Small Businesses. The goal for the utilization of Certified MBE/WBE's and Veteran-Owned Small Businesses as subcontractors are recommended goals. Contractors who fail to meet such goals will be expected to provide written explanations to the Director of the Division of Central Purchasing of efforts they have made to accomplish the recommended goals and the extent to which they are successful in accomplishing the recommended goals will be a consideration in the procurement process.

For assistance in locating MBE/WBE Subcontractors contact Sherita Miller at 859/258-3320 or by writing the address listed below:

Sherita Miller, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, Kentucky 40507
smiller@lexingtonky.gov

Lexington-Fayette Urban County Government
MWDBE PARTICIPATION GOALS

A. GENERAL

- 1) The LFUCG request all potential contractors to make a concerted effort to include Minority-Owned (MBE), Woman-Owned (WBE), Disadvantaged (DBE) Business Enterprises and Veteran-Owned Small Businesses (VOSB) as subcontractors or suppliers in their bids.
- 2) Toward that end, the LFUCG has established 10% of total procurement costs as a Goal for participation of Minority-Owned, Woman-Owned and Disadvantaged Businesses on this contract.
- 3) **It is therefore a request of each Bidder to include in its bid, the same goal (10%) for MWDBE participation and other requirements as outlined in this section.**
- 4) The LFUCG has also established a 3% of total procurement costs as a Goal for participation for of Veteran-Owned Businesses.
- 5) **It is therefore a request of each Bidder to include in its bid, the same goal (3%) for Veteran-Owned participation and other requirements as outlined in this section.**

B. PROCEDURES

- 1) The successful bidder will be required to report to the LFUCG, the dollar amounts of all payments submitted to Minority-Owned, Woman-Owned or Veteran-Owned subcontractors and suppliers for work done or materials purchased for this contract. (See Subcontractor Monthly Payment Report)
- 2) Replacement of a Minority-Owned, Woman-Owned or Veteran-Owned subcontractor or supplier listed in the original submittal must be requested in writing and must be accompanied by documentation of Good Faith Efforts to replace the subcontractor / supplier with another MWDBE Firm; this is subject to approval by the LFUCG. (See LFUCG MWDBE Substitution Form)
- 3) For assistance in identifying qualified, certified businesses to solicit for potential contracting opportunities, bidders may contact:
 - a) The Lexington-Fayette Urban County Government, Division of Central Purchasing (859-258-3320)
- 4) The LFUCG will make every effort to notify interested MWDBE and Veteran-Owned subcontractors and suppliers of each Bid Package, including information on the scope of work, the pre-bid meeting time and location, the bid date, and all other pertinent information regarding the project.

C. DEFINITIONS

- 1) A Minority-Owned Business Enterprise (MBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by persons of African American, Hispanic, Asian, Pacific Islander, American Indian or Alaskan Native Heritage.
- 2) A Woman-Owned Business Enterprise (WBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by one or more women.
- 3) A Disadvantaged Business (DBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a person(s) that are economically and socially disadvantaged.

- 4) A Veteran-Owned Small Business (VOSB) is defined as a business which is certified as being at least 51% owned, managed and controlled by a veteran and/or a service disabled veteran.
- 5) Good Faith Efforts are efforts that, given all relevant circumstances, a bidder or proposer actively and aggressively seeking to meet the goals, can reasonably be expected to make. In evaluating good faith efforts made toward achieving the goals, whether the bidder or proposer has performed the efforts outlined in the Obligations of Bidder for Good Faith Efforts outlined in this document will be considered, along with any other relevant factors.

D. OBLIGATION OF BIDDER FOR GOOD FAITH EFFORTS

- 1) **The bidder shall make a Good Faith Effort to achieve the Participation Goal for MWDBE and Veteran-Owned subcontractors/suppliers. The failure to meet the goal shall not necessarily be cause for disqualification of the bidder; however, bidders not meeting the goal are required to furnish with their bids written documentation of their Good Faith Efforts to do so.**
- 2) Award of Contract shall be conditioned upon satisfaction of the requirements set forth herein.
- 3) The Form of Proposal includes a section entitled “MWDBE Participation Form”. The applicable information must be completed and submitted as outlined below.
- 4) **Failure to submit this information as requested may be cause for rejection of bid or delay in contract award.**

E. DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS

- 1) Bidders reaching the Goal are required to submit only the MWDBE Participation Form.” The form must be fully completed including names and telephone number of participating MWDBE firm(s); type of work to be performed; estimated value of the contract and value expressed as a percentage of the total Lump Sum Bid Price. The form must be signed and dated, and is to be submitted with the bid.
- 2) Bidders not reaching the Goal must submit the “MWDBE Participation Form”, the “Quote Summary Form” and a written statement documenting their Good Faith Effort to do so. If bid includes no MWDBE and/or Veteran participation, bidder shall enter “None” on the subcontractor / supplier form). In addition, the bidder must submit written proof of their Good Faith Efforts to meet the Participation Goal:
 - a. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow MWDBE firms and Veteran-Owned businesses to participate.
 - b. Included documentation of advertising in the above publications with the bidders good faith efforts package
 - c. Attended LFUCG Central Purchasing Economic Inclusion Outreach event
 - d. Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned businesses of subcontracting opportunities

- e. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses.
- f. Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).
- g. Contacted organizations that work with MWDBE companies for assistance in finding certified MWDBE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.
- h. Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs and/or Veteran-Owned businesses soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.
- i. Followed up initial solicitations by contacting MWDBEs and Veteran-Owned Businesses to determine their level of interest.
- j. Provided the interested MWDBE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.
- k. Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation, even when the prime contractor may otherwise perform these work items with its own workforce
- l. Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.
- m. Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.
- n. Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.
- o. Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal
- p. Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

q. Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

Note: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to review by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.



MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA
Minority Business Enterprise Liaison
Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507
smiller@lexingtonky.gov
859-258-3323

OUR MISSION: The mission of the Minority Business Enterprise Program is to facilitate the full participation of minority and women owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long term economic viability of Lexington-Fayette Urban County Government.

To that end the city council adopted and implemented Resolution 484-2017 – A Certified Minority, Women and Disadvantaged Business Enterprise ten percent (10%) minimum goal and a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and Certified Service Disabled Veteran – Owned Businesses for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals (a full copy is available in Central Purchasing):

Certified Disadvantaged Business Enterprise (DBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a person(s) who is socially and economically disadvantaged as define by 49 CFR subpart 26.

Certified Minority Business Enterprise (MBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. African American, Asian American/Pacific Islander, Hispanic Islander, Native American/Native Alaskan Indian) as defined in federal law or regulation as it may be amended from time-to-time.

Certified Women Business Enterprise (WBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a woman.

Certified Veteran-Owned Small Business (VOSB) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

Certified Service Disabled Veteran Owned Small Business (SDVOSB) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a disabled veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

The term “Certified” shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Purchasing as having the appropriate credentials to make a determination as to the status of the business.

To comply with Resolution 484-2017, prime contractors and minority, women and veteran owned businesses must enroll in the new Diverse Business Management Compliance system, <https://lexingtonky.diversitycompliance.com/>

We have compiled the list below to help you locate certified MBE, WBE and DBE certified businesses. Below is a listing of contacts for LFUCG Certified MWDBEs and Veteran-Owned Small Businesses in (<https://lexingtonky.ionwave.net>)

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shawn Rogers UK SBDC	shawn.rogers@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women’s Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner’s Council (NWBOC)	Janet Harris-Lange	janet@nwbo.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	production@keynewsjournal.com	859-685-8488



LEXINGTON

LFUCG MWDBE PARTICIPATION FORM

Bid/RFP/Quote Reference # 52-2023

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Central Purchasing for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWDBE Company, Name, Address, Phone, Email	MBE WBE or DBE	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1. NONE				
2.				
3.				
4.				

The undersigned company representative submits the above list of MWDBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Pavement Technology, Inc.

Company

5/16/23

Date

Company Representative Susan Durante

Secretary/Treasurer

Title



LEXINGTON

LFUCG MWDBE PARTICIPATION FORM

Bid/RFP/Quote Reference # 52-2023

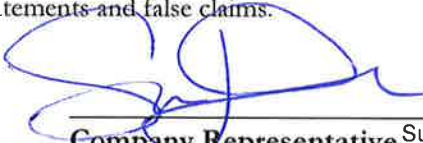
The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Central Purchasing for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWDBE Company, Name, Address, Phone, Email	MBE WBE or DBE	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1. NONE				
2.				
3.				
4.				

The undersigned company representative submits the above list of MWDBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Pavement Technology, Inc.
Company

5/16/23
Date


Company Representative Susan Durante

Secretary/Treasurer
Title



LEXINGTON

LFUGG MWDBE SUBSTITUTION FORM

Bid/RFP/Quote Reference # 52-2023

The substituted MWDBE and/or veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to Central Purchasing for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project. **Failure to submit this form may cause rejection of the bid.**

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1. NONE					
2.					
3.					
4.					

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Pavement Technology, Inc.
Company

5/16/23
Date

Company Representative Susan Durante

Secretary/Treasurer
Title



LEXINGTON

MWDBE QUOTE SUMMARY FORM

Bid/RFP/Quote Reference # 52-2023

The undersigned acknowledges that the minority and/or veteran subcontractors listed on this form did submit a quote to participate on this project. Failure to submit this form may cause rejection of the bid.

Company Name Pavement Technology, Inc.	Contact Person Debbie Cancelliere, Contract Administrator
Address/Phone/Email 24144 Detroit Road, Westlake, OH 44145 440-892-1895 dcancelliere@pavetechinc.com	Bid Package / Bid Date 52-2023 5/18/2023

MWDBE Company Address	Contact Person	Contact Information (work phone, Email, cell)	Date Contacted	Services to be performed	Method of Communication (email, phone meeting, ad, event etc)	Total dollars \$\$ Do Not Leave Blank (Attach Documentation)	MBE * AA HA AS NA Female	Veteran
NONE								

(MBE designation / AA=African American / HA= Hispanic American/AS = Asian American/Pacific Islander/ NA= Native American)

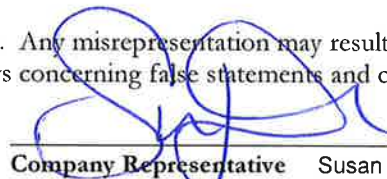
The undersigned acknowledges that all information is accurate. Any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Pavement Technology, Inc.

Company

5/16/23

Date



Company Representative Susan Durante

Secretary/Treasurer

Title

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by MWDBE and Veteran-Owned business enterprises on the project and can supply the appropriate documentation.

_____ Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow MWDBE firms and Veteran-Owned businesses to participate.

_____ Included documentation of advertising in the above publications with the bidders good faith efforts package

_____ Attended LFUCG Central Purchasing Economic Inclusion Outreach event

_____ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned Businesses of subcontracting opportunities

_____ Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses

_____ Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

_____ Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____ Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

_____ Followed up initial solicitations by contacting MWDBEs and Veteran-Owned businesses to determine their level of interest.

_____ Provided the interested MWBDE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

_____ Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation, even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms and

Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

_____ Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____ Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

_____ Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

NOTE: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

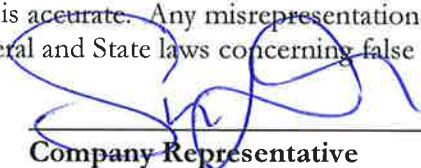
The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Pavement Technology, Inc. _____

Company

5/16/23 _____

Date



Company Representative

Susan Durante

Secretary/Treasurer

Title

**AMENDMENT 1 —
CERTIFICATION OF COMPLIANCE FOR EXPENDITURES USING FEDERAL FUNDS,
INCLUDING THE AMERICAN RESCUE PLAN ACT**

The Lexington-Fayette Urban County Government (“LFUCG”) may use Federal funding to pay for the goods and/or services that are the subject matter of this bid. That Federal funding may include funds received by LFUCG under the American Rescue Plan Act of 2021. Expenditures using Federal funds require evidence of the contractor’s compliance with Federal law. Therefore, by the signature below of an authorized company representative, you certify that the information below is understood, agreed, and correct. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

The bidder (hereafter “bidder,” or “contractor”) agrees and understands that in addition to all conditions stated within the attached bid documents, the following conditions will also apply to any Agreement entered between bidder and LFUCG, if LFUCG uses Federal funds, including but not limited to funding received by LFUCG under the American Rescue Plan Act (“ARPA”), toward payment of goods and/or services referenced in this bid. The bidder also agrees and understands that if there is a conflict between the terms included elsewhere in this Request for Proposal and the terms of this Amendment 1, then the terms of Amendment 1 shall control. The bidder further certifies that it can and will comply with these conditions, if this bid is accepted and an Agreement is executed:

1. Any Agreement executed as a result of acceptance of this bid may be governed in accordance with 2 CFR Part 200 and all other applicable Federal law and regulations and guidance issued by the U.S. Department of the Treasury.
2. Pursuant to 24 CFR § 85.43, any Agreement executed as a result of acceptance of this bid can be terminated if the contractor fails to comply with any term of the award. This Agreement may be terminated for convenience in accordance with 24 CFR § 85.44 upon written notice by LFUCG. Either party may terminate this Agreement with thirty (30) days written notice to the other party, in which case the Agreement shall terminate on the thirtieth day. In the event of termination, the contractor shall be entitled to that portion of total compensation due under this Agreement as the services rendered bears to the services required. However, if LFUCG suspects a breach of the terms of the Agreement and/or that the contractor is violating the terms of any applicable law governing the use of Federal funds, LFUCG may suspend the contractor’s ability to receive payment by giving thirty (30) days’ advance written notice. Further, either party may terminate this Agreement for cause shown with thirty (30) days written notice, which shall explain the party’s cause for the termination. If the parties do not reach a settlement before the end of the 30 days, then the Agreement shall terminate on the thirtieth day. In the event of a breach, LFUCG reserves the right to pursue any and all applicable legal, equitable, and/or administrative remedies against the contractor.
3. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
 - (1) Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event a contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

4. If fulfillment of the contract requires the contractor to employ mechanic's or laborers, the contractor further agrees that it can and will comply with the following:

- (1) Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such a workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such a workweek.
- (2) Violation: liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section, the contractor and any subcontractor responsible therefor shall be liable for

the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

- (3) Withholding for unpaid wages and liquidated damages. LFUCG shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

6. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.

7. The contractor shall include these requirements in numerical paragraphs 5 and 6 in each subcontract exceeding \$100,000 financed in whole or in part with Federal funding.

8. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

9. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.

10. The contractor shall include these requirements in numerical paragraphs 8 and 9 in each subcontract exceeding \$100,000 financed in whole or in part with Federal funds.

11. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

12. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency regional office.

13. The contractor shall include these requirements in numerical paragraphs 11 and 12 in each subcontract exceeding \$100,000 financed in whole or in part with American Rescue Plan Act funds.

14. The contractor shall include this language in any subcontract it executes to fulfill the terms of this bid: "the subgrantee, contractor, subcontractor, successor, transferee, and assignee shall comply with Title VI of the Civil Rights

Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with 'Limited English Proficiency' in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, and herein incorporated by reference and made a part of this contract or agreement."

15. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency. Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier, up to the recipient. The required certification is included here:

- a. The undersigned certifies, to the best of his or her knowledge and belief, that:
 - (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
 - (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.
- b. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

16. The contractor acknowledges and certifies that it has not been debarred or suspended and further acknowledges and agrees that it must comply with regulations regarding debarred or suspended entities in accordance with 24 CFR § 570.489(l). Funds may not be provided to excluded or disqualified persons.

17. The contractor agrees and certifies that to the greatest extent practicable, it will prefer the purchase, acquisition, and use of all applicable goods, products or materials produced in the United States, in conformity with 2 CFR 200.322 and/or section 70914 of Public Law No. 117-58, §§ 70901-52, also known as the Infrastructure Investment and Jobs Act, whichever is applicable.

18. The contractor agrees and certifies that all activities performed pursuant to any Agreement entered as a result of the contractor's bid, and all goods and services procured under that Agreement, shall comply with 2 C.F.R. § 200.216 (Prohibition on certain telecommunications and video surveillance services and equipment) and 2 C.F.R. 200 § 200.323 (Procurement of recovered materials), to the extent either section is applicable.

19. If this bid involves construction work for a project totaling \$10 million or more, then the contractor further agrees that all laborers and mechanics, etc., employed in the construction of the public facility project assisted with funds provided under this Agreement, whether employed by contractor, or contractor's contractors, or subcontractors, shall be paid wages complying with the Davis-Bacon Act (40 U.S.C. 3141-3144). Contractor agrees that all of contractor's contractors and subcontractors will pay laborers and mechanics the prevailing wage as determined by the Secretary of Labor and that said laborers and mechanics will be paid not less than once a week. The contractor agrees to comply with the Copeland Anti- Kick Back Act (18 U.S.C. § 874) and its implementing regulations of the U.S. Department of Labor at 29 CFR part 3 and part 5. The contractor further agrees to comply with the applicable provisions of the Contract Work Hours and Safety Standards Act (40 U.S.C. Section 327-333), and the applicable provisions of the Fair Labor Standards Act of 1938, as amended (29 U.S.C. et seq.). Contractor further agrees that it will report all suspected or reported violations of any of the laws identified in this paragraph to LFUCG.



Susan Durante, Secretary/Treasurer
Signature

5/16/23

Date

**RISK MANAGEMENT PROVISIONS
INSURANCE AND INDEMNIFICATION**

INDEMNIFICATION AND HOLD HARMLESS PROVISION

- (1) It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "CONTRACTOR") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.
- (2) CONTRACTOR shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.
- (3) In the event LFUCG is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.
- (4) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.
- (5) LFUCG is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

FINANCIAL RESPONSIBILITY

BIDDER/CONTRACTOR understands and agrees that it shall demonstrate the ability to assure compliance with the above Indemnity provisions and these other risk management provisions prior to final acceptance of its bid and the commencement of any work or provision of goods.

INSURANCE REQUIREMENTS

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Required Insurance Coverage

BIDDER/CONTRACTOR shall procure and maintain for the duration of this contract the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to LFUCG in order to protect LFUCG against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by CONTRACTOR. The cost of such insurance shall be included in any bid:

<u>Coverage</u>	<u>Limits</u>
General Liability (Insurance Services Office Form CG 00 01)	\$1 million per occurrence, \$2 million aggregate
Worker's Compensation	Statutory
Employer's Liability	\$100,000
Excess/Umbrella Liability	\$2 million per occurrence
Contractors Pollution Liability	\$2 million per occurrence

The policies above shall contain the following conditions:

- a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). LFUCG shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.
- b. The General Liability Policy shall be primary to any insurance or self-insurance retained by LFUCG.
- c. The General Liability Policy shall include Premises and Operations coverage unless it is deemed not to apply by LFUCG.
- d. The General Liability Policy shall include Employment Practices Liability coverage or an endorsement in a minimum amount of \$1 million unless it is deemed not to apply by LFUCG.
- e. The Policy shall include Umbrella/Excess Liability coverage in the amount of \$2 million per occurrence, \$2 million aggregate, unless it is deemed not to apply by LFUCG.
- f. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.
- g. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

Renewals

After insurance has been approved by LFUCG, evidence of renewal of an expiring policy must be submitted to LFUCG, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

Deductibles and Self-Insured Programs

IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of BIDDER/CONTRACTOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage

Safety and Loss Control

CONTRACTOR shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and LFUCG.

Verification of Coverage

BIDDER/CONTRACTOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

CONTRACTOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to insure compliance with these Insurance Requirements.

DEFAULT

BIDDER/CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging BIDDER/CONTRACTOR for any such insurance premiums purchased, or suspending or terminating the work.

Asphalt Rejuvenating Agent

I. Scope:

This work shall consist of furnishing all labor, material, and equipment necessary to perform all operations for the application of an asphalt rejuvenating agent to asphaltic concrete surface courses. The rejuvenation of surface courses shall be by spray application of a cationic rejuvenating agent composed of petroleum oils and resins emulsified with water. All work shall be in accordance with the specifications, the applicable drawings, and subject to the terms and conditions of this contract. LFUCG reserves the right to award contract to multiple bidders.

II. Material Specifications

The asphalt rejuvenating agent shall be composed of a petroleum resin oil base uniformly emulsified with water. Each bidder must submit with his bid, a certified statement from the manufacturer showing that the restorative seal emulsion conforms to the required physical and chemical requirements.

Test Method Tests	<u>Specifications Requirements</u>			
	ASTM	AASHTO	Min.	Max
Tests of Emulsion:				
Viscosity @ 25°C, SFS	D-244	T-59	15	40
Residue, % W ¹	D-244 (Mod.)	T-59 (Mod)	60	65
Miscibility Test ²	D-244 (Mod.)	T-59 (Mod)	No Coagulation	
Sieve Test, %W ³	D-244 (Mod.)	T-59 (Mod)	-	0.1
Particle Charge Test	D-244	T-59	Positive	
Percent Light Transmittance ⁴	GB	GB	-	30
Tests on Residue from Distillation:				
Flash Point, COC, °C	D-92	T-48	196	-
Viscosity @ 60°C, cSt	D-445	-	100	200
Asphaltenes, \$w	D-2006-70	-	-	1.00
Maltene Dist. Ratio	D-2006-70	-	0.3	0.6
	PC + A ₁ ⁵			
	S + A ₂			
PC/S Ratio ⁵	D-2006-70	-	0.5	-
Saturated Hydrocarbons, S ⁵	D-2006-70	-	21	28

¹ ASTM D-244 Modified Evaporation Test for percent of residue is made by heating 50 gram sample to 149 °C (300°F) until foaming ceases, then cool immediately and calculate results.

² Test procedure identical with ASTM D-244-60 except that .02 Normal Calcium Chloride solution shall be used in place of distilled water.

³ Test procedure identical with ASTM D-244 except that distilled water shall be used in place of two percent sodium oleate solution.

4. Test procedure is attached.
5. Chemical composition by ASTM Method D-2006-70:
PC = Polar Compounds A₁ = First Acidaffins,
A₂ = Second Acidaffins, S = Saturated Hydrocarbons

Emulsion shall be freeze stabilized and if freezing has occurred a homogeneous mixture shall be obtained when the material has thawed and been thoroughly mixed.

III. Material Performance:

The rejuvenating agent shall have a record of at least five years of satisfactory service as a rejuvenating agent and in-depth sealer. Satisfactory service shall be based on the capability of the material to penetrate the surface and seal the asphalt in-depth to the intrusion of air and water.

Each bidder must submit with his bid the manufacturer's certification that the material proposed for use is in compliance with the specification requirements. The bidder must submit with his bid previous use documentation conclusively demonstrating that; the restorative seal emulsion has been used successfully for a period of five years by government agencies such as cities, counties, etc., and that the restorative seal emulsion has been proven to perform as heretofore requested.

Reclamite, manufactured by the Witco Corporation, is a product of known quality and accepted performance.

IV. Applicator Experience:

The asphalt rejuvenating agent shall be applied by an experienced applicator of such material. The bidder shall have a minimum of three years experience in applying the product proposed for use. He must submit with his bid a list of five projects on which he applied said rejuvenator. He shall indicate the project dates, number of square yards treated in each and the name and phone number of the government official in charge of each project.

A project superintendent knowledgeable and experienced in application of the asphalt rejuvenating agent must be in control of each day's work. The bidder shall submit a written experience outline of the project superintendent.

V. Product Standards and Alternatives:

The product Reclamite for the asphalt rejuvenating agent as manufactured by Witco Corporation is the standard for these specifications and the prices quoted on the Bid sheet Base Bid shall be for this standard. Should a bidder wish to submit a bid for alternatives to the Standard, said prices shall be entered on the BID SHEET as the "Alternative Bid" for each item. In the event that the bidder submits no bid for the Standard, only the "Alternate Bids" should be completed.

Bidders may offer an ALTERNATE for the Standard specified in the Specifications provided the bidder adheres to the following and submits same with his bid.

(a) List the proposed alternate on the BID SHEET form giving the product name and price.

(b) Furnish complete specifications and descriptive literature for the alternate as well as a one-gallon sample of the material proposed for use. Such descriptive and detailed information shall be complete and at least equal in detail to the city's requirements for the standard item for which the alternate is offered.

(c) Submit a current material Safety Data Sheet for the alternate materials.

The alternate will be given consideration by the City. The Contractor may furnish only those alternate items included in his proposal and approved by the City prior to award of a contract.

If no ALTERNATE is indicated on the BID SHEET, the Contractor shall furnish the STANDARD (brand) specified in the attached specifications.

Should the ALTERNATE offered by found unacceptable by the city based on the data submitted with the bid and no bid is entered on the BID SHEET for the Standard, then said bid will be considered non-responsive.

VI. Application Temperature / Weather Limitations:

The temperature of the asphalt rejuvenating emulsion, at the time of application, shall be as recommended by the manufacturer. The asphalt rejuvenating agent shall be applied only when the existing surface to be treated is thoroughly dry and when it is not threatening to rain. The asphalt rejuvenating agent shall not be applied when the ambient temperature is below 50°F.

VII. Handling of Asphalt Rejuvenating Agent:

Contents in tank cars or storage tanks shall be circulated at least forty-five minutes before withdrawing any materials for application. When loading the distributor, the asphalt rejuvenating agent concentrate shall be loaded first and then the required amount of water shall be added. The water shall be added into the distributor with enough force to cause agitation and thorough mixing of the two materials. To prevent foaming, the discharge end of the water hose or pipe shall be kept below the surface of the material in the distributor which shall be used as a spreader. The distributor truck will be cleaned of all of its asphalt materials, and washed out to the extent that no discoloration of the emulsion may be perceptible. Cleanliness of the spreading equipment shall be subject to the approval and satisfaction of the Streets and Roads Representative.

VIII. Resident Notification:

The contractor shall distribute by hand, a typed notice to all residences and businesses on the street to be treated. The notice will be delivered no more than 48 hours prior to the treatment of the road. The notice will have a local phone number that residents may call to ask questions. The notice shall be of the door hanger type which secures to the door handle of each dwelling. Unsecured notices will not be allowed. The contractor shall also place the notice on the windshield of

any parked cars on the street. Hand distribution of this notice will be considered incidental to the contract. The Contractor shall contact the LFUCG Division Streets and Roads to obtain "No Parking" signs to post on the streets to be treated. This is to be done with a minimum of 24 hour advance notice.

IX. Applying Equipment:

The distributor for spreading the emulsion shall be self-propelled, and shall have pneumatic tires. The distributor shall be designed and equipped to distribute the rejuvenating agent uniformly on variable widths of surface at readily determined and controlled rates from 0.05 to 0.5 gallons per square yard of surface, and with an allowable variation from any specified rate not to exceed 5 percent of the specified rate.

Distributor equipment shall include full circulation spray bars, pump tachometer, volume measuring device and a hand hose attachment suitable for application of the emulsion manually to cover areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the emulsion within the tank.

A check of distributor equipment as well as application rate accuracy and uniformity of distribution shall be made when directed by the Streets & Roads Representative.

The truck used for sanding shall be equipped with a spreader that allows the sand to be uniformly distributed onto the pavement. The spreader shall be able to apply ½ pound to 3 pounds of sand per square yard in a single pass. The spreader shall be adjustable so as not to broadcast sand onto driveways or treelawns.

The sand to be used shall be free flowing, without any leaves, dirt, stones, etc. Any wet sand shall be rejected from the job site.

Any equipment which is not maintained in full working order, or is proven inadequate to obtain the results prescribed, shall be repaired or replaced at the direction of the Streets & Roads Representative.

X. Application of Rejuvenating Agent:

The rejuvenating agent shall be applied by a distribution truck at the temperature recommended by the manufacturer and at the pressure required for proper distribution. The emulsion shall be so applied that uniform distribution is obtained at all points of the area to be treated. Distribution shall commence with a running start to insure full rate of spread over the entire area to be treated. Areas inadvertently missed shall receive additional treatment as may be required by hand sprayer application.

Application of the rejuvenating agent shall be on one-half width of the pavement at a time. When the second half of the surface is treated, the distributor nozzle nearest the center of the road shall overlap the previous application by at least one-half the width of the nozzle spray. In any event, the centerline construction joint of the pavement shall be treated in both application passes of the distributor truck.

Before spreading, the rejuvenating agent shall be blended with water at the rate two (2) parts rejuvenating agent to one (1) part water, by volume or as specified

by the manufacturer. The combined mixture of rejuvenating agent and water shall be spread at the rate of 0.05 to 0.10 gallons per square yard, or as approved by the Streets & Roads Representative following field testing.

Where more than one application is to be made, succeeding applications shall be made as soon as penetration of the preceding application has been completed and approval is granted for additional applications by the Streets & Roads Representative.

Grades or super elevations of surfaces that may cause excessive runoff, in the opinion of the Streets & Roads Representative, shall have the required amounts applied in two or more applications as directed.

After the street has been treated, the area within one foot of the curb line on both sides of the road shall receive an additional treatment of the asphalt rejuvenating emulsion. Said treatment shall be uniformly applied by a method acceptable to the Streets & Roads Representative.

After the rejuvenating emulsion has penetrated, a coating of dry sand shall be applied to the surface in sufficient amount to protect the traveling public as required by the Streets & Roads Representative.

The Contractor shall furnish a quality inspection report showing the source, manufacturer, and the date shipped, for each load of asphalt rejuvenating agent. When directed by the Streets & Roads Representative, the Contractor shall take representative samples of material for testing.

XI. Street Sweeping:

The LFUCG Division of Streets & Roads shall be responsible for sweeping and cleaning of the streets prior to, and after treatment.

Prior to treatment, the Contractor will clean the streets of all standing water, dirt, leaves, foreign materials, etc. This work shall be accomplished by hand brooming, power blowing or other approved methods.

If, after sand is swept and in the opinion of the Streets & Roads Representative a hazardous condition exists on the roadway, the contractor must apply additional sand. No additional compensation will be allowed for reapplications of sand.

XII. Traffic Control:

The Contractor shall schedule his operations and carry out the work in a manner to cause the least disturbance and / or interference with the normal flow of traffic over the areas to be treated. Treated portions of the pavement surfaces shall be kept closed and free from traffic until penetration, in the opinion of the Streets & Roads Representative, has become complete and the area is suitable for traffic.

When, in the opinion of the Streets & Roads Representative, traffic must be maintained at all times on a particular street, then the Contractor shall apply asphalt rejuvenating agent to one lane at a time. Traffic shall be maintained in the untreated lane until the traffic may be switched to the completed lane.

The Contractor shall be responsible for all traffic control and signing required to permit safe travel. The Contractor shall notify the Police and Fire departments as to the streets that are to be treated each day.

If, in the opinion of the Streets & Roads Representative, proper signing is not being used, the Contractor shall stop all operations until safe signing and barricading is achieved.

XIII. Method of Measurement:

Asphalt rejuvenating agent will be measured by the square yard as provided for in the list to be provided to the Contractor annually at the time of scheduling.

XIV. Basis for Payment:

The accepted quantities, measured as provided for above, will be paid for at the contract unit price for asphalt rejuvenating agent.

Asphalt rejuvenating agent shall be paid for **PER SQUARE YARD** which shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified and required.

Asphalt Rejuvenating Bid Sheet

BASE BID

The understood proposes to furnish material, labor, etc. According to the terms and conditions of the attached Lexington-Fayette Urban County Government Specifications at the following unit prices, to wit:

200,000 Square Yards, more or less, Construction Sealing with Asphalt Rejuvenating Agent furnished and applied.

Reclamite \$ 1.19 Per Square Yard
Product Name

Contractor will begin work 15 days after written notice. Contractor shall complete work within 180 days of notice to proceed.

Price Terms: **Payment will be made thirty (30) days after final inspection and approval by the commissioner.**

ALTERNATE BID

The understood proposes to furnish material, labor, etc. According to the terms and conditions of the attached Lexington Fayette Urban County Government Specifications at the following unit prices, to wit:

200,000 Square Yards, more or less, Construction Sealing with Asphalt Rejuvenating Agent furnished and applied.

A.R.A.-1 Ti® Please see attached \$ page for pricing Per Square Yard
Product Name

Contractor will begin work 15 days after written notice. Contractor shall complete work within 180 days of notice to proceed.

Price Terms: **Payment will be made thirty (30) days after final inspection and approval by the commissioner.**

Pavement Technology, Inc.
Bidder


Authorized Agent Susan Durante

24144 Detroit Road
Street Address

Westlake, OH 44145
City State Zip

440-892-1895 440-892-0953
Phone Number Fax Number

Pavement Technology, Inc.

24144 Detroit Rd.
Westlake, Ohio 44145

Phone: (800) 333-6309 (440) 892-1895
Fax: (440) 892-0953

Lexington-Fayette Urban County Government
ITB 52-2023 Asphalt Rejuvenation

Pricing for A.R.A.-1Ti®

For Quantities:

*minimum of 25,000 sq. yds. required

25,000 sq. yds. – 50,000 sq. yds.	\$2.85 per sq. yd.
50,001 sq. yds. – 100,000 sq. yds.	\$2.25 per sq. yd.
100,001 sq. yds. & up	\$1.94 per sq. yd.

EEO/AA
Policy Statement

Equal Employment Opportunity/Affirmative Action (EEO/AA) Policy Statement

This statement is to reaffirm Pavement Technology's policy on providing Equal Employment Opportunity to all employees and applicants for employment in accordance with all applicable Equal Employment Opportunity / Affirmative Action laws, directives and regulations of Federal, State and Local governing bodies or agencies thereof.

Pavement Technology, Inc. will not discriminate against any employee or applicant for employment because of race, color, sex, national origin, sexual orientation, age, handicap, marital status, familial status or religion.

Pavement Technology, Inc. will take Affirmative Action to ensure that all employment practices are free of such discrimination. Such employment practices include, but are not limited to, the following: hiring, upgrading demotion, transfer, recruitment or recruitment advertising, selection layoff disciplinary action, termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

Pavement Technology, Inc. prohibits the harassment of any employee or job applicant on the basis of their protected class status.

Pavement Technology, Inc. will commit the necessary time and resources, both financial and human, to achieve the goals of Equal Employment Opportunity and Affirmative Action.

Pavement Technology, Inc. will evaluate the performance of its management and supervisory personnel on the basis of their involvement in achieving these Affirmative Action objectives as well as other established criteria. Any employee of this Company or subcontractors to this Company who do not comply with the Equal Employment Opportunity Policies and Procedures set forth in this Statement and plan will be subject to disciplinary action. Any subcontractor not complying with all applicable Equal Employment Opportunity / Affirmative Action laws, directives and regulations of the Federal, State and local-governing bodies or agencies thereof, will be subject to appropriate legal sanctions.

Pavement Technology, Inc. has appointed Susan J. Durante as EEO Coordinator to manage our Equal Employment Opportunity Program. The responsibilities will include monitoring all Equal Employment Opportunity activities and reporting the effectiveness of this Affirmative Action Program, as required by Federal, State and Local agencies. If any employee or applicant for employment believes he/she has been discriminated against, please contact the EEO Coordinator.

Signature: _____


Susan J. Durante, EEO Coordinator

Date: 5/10/23

**Lexington Fayette Urban
County Government
Contractor Registration**

**Lexington Fayette
Urban County Government
CONTRACTOR REGISTRATION**



Be It Known That
PAVEMENT TECHNOLOGY INC
is hereby granted
Registration # 14222
as a
Specialty Contractor
in Lexington-Fayette County
Expiration Date: 12/31/2023

HERE IS YOUR WALLET CARD. YOU MAY CUT OUT AND SIGN THE BACK TO CARRY WITH YOU.

LEXINGTON-FAYETTE URBAN COUNTY REGISTERED CONTRACTOR	
	PAVEMENT TECHNOLOGY INC is registered as a Specialty Contractor
<i>Registration #</i> 14222	<i>Expiration Date</i> 12/31/2023

Project Experience Record

PAVEMENT TECHNOLOGY INC.

24144 DETROIT ROAD
WESTLAKE, OHIO 44145
(440) 892-1895
(800) 333-6309
FAX (440) 892-0953

Asphalt Recycling & Preventive Maintenance Specialists

Experience Record Reclamite® Asphalt Rejuvenating Agent Application

<u>City and Contact</u>	<u>Project Information</u>	<u>Using Reclamite® Since</u>
Hamilton County Eric Beck 138 E. Court Street, Room 709 Cincinnati, OH 45202 P: 513-946-8430 E: eric.beck@hamilton-co.org	2022 Resurfacing Program 9/9/2022 – 10/13/2022 146,886 sq. yd. \$146,886.00	2003
City of Cincinnati Joe Flading 801 Plum Street Cincinnati, OH 45202 P: 513-352-5284 E: joe.flading@cincinnati-oh.gov	2021 Street Rehabilitation 10/29/2022 – 4/20/2023 54,828 sq. yd. \$52,023.60	1999
Delhi Township Ron Ripperger 934 Neeb Road Cincinnati, OH 45238 P: 513-922-8609 E: rripperger@delhi.oh.us	2022 Rejuvenation 10/13/2022 – 10/15/2022 25,715 sq. yd. \$28,826.50	1998
Franklin County Brad Foster 970 Dublin Road Columbus, OH 43215 P: 614-462-3839 E: bfoster@franklincountyengineer.org	2021 Resurfacing 11/3/2021 – 11/5/2021 42,660 sq. yd. \$40,527.00	2000
Montgomery County Joe Dura 451 W. Third Street Dayton, OH 45422 P: 937-225-4904 E: duraj@mcoho.org	2022 Harrison Township Resurfacing 8/25/2022 – 8/27/2022 80,003 sq. yd. \$43,248.00	2000

Montgomery County
Jackie Powers
1213 Highway Drive
Clarksville, TN 37043
P: 931-648-5740
E: jlpowers@mcgtn.net

2021 Asphalt Rejuvenation
4/6/2022 – 4/29/2022
290,163 sq. yd.
\$264,646.70

2022

Reclamite® Submittals



EMULSIONS
INC.

Quality Products and Dependable Service Since 1961

Licensed Manufacturer
Tricor Refining, LLC
Producers of Golden Bear® Preservation Products

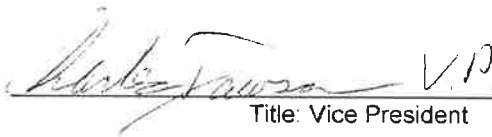
CERTIFICATE OF COMPLIANCE

TO WHOM IT MAY CONCERN

PRODUCT: RECLAMITE®

IT IS HEREBY CERTIFIED THAT THE ABOVE PRODUCT DESIGNATED HEREON CONFORMS TO THE APPLICABLE SPECIFICATIONS FOR THE PRODUCT SO INDICATED, AND THAT PAVEMENT TECHNOLOGY, INCORPORATED HAS BEEN AN AUTHORIZED APPLICATOR FOR D & D EMULSIONS, INC., AN AUTHORIZED LICENSED MANUFACTURER FOR TRICOR REFINING, LLC.

Date: January 16, 2023 Approved by:


Title: Vice President



RECLAMITE® Asphalt Rejuvenating Agent

AUTHORIZED DISTRIBUTOR

Specifications:

Tests	Test Method		Requirements	
	ASTM	AASHTO	Min.	Max.

Tests on Emulsion:

Viscosity @ 25°C, SFS	D-244	T-59	15	40
Residue, % w ⁽¹⁾	D-244 (mod)	T-59 (mod)	60	65
Miscibility Test ⁽²⁾	D-244 (mod)	T-59 (mod)	No Coagulation	
Sieve Test, % w ⁽³⁾	D-244 (Mod)	T-59 (mod)	---	0.1
Particle Charge Test	D-244	T-59	Positive	
Percent Light Transmittance ⁽⁴⁾	GB	GB	---	30
Cement Mixing	D-244			2.0

Tests on Residue from Distillation

Flash Point, COC, °C	D-92	T-48	196	---
Viscosity @ 60°C, cSt	D-445	---	100	200
Asphaltenes, %w	D-2006-70	---		0.75
Maltene Distribution Ratio	D-2006-70	---	0.3	0.6
$\frac{PC + A_1}{S + A_2}$ ⁽⁵⁾				
PC/S Ratio ⁽⁵⁾	D-2006-70	---	0.5	---
Saturate hydrocarbons, S ⁽⁵⁾	D-2006-70	---	21	28

¹ASTM D-244 Evaporation Test for percent of residue is made by heating 50 gram sample to 149°C (300°F) until foaming ceases, then cool immediately and calculate results.

²Test procedure identical with ASTM D-244 60 except that .02 Normal Calcium Chloride solution shall be used in place of distilled water..

³Test procedure identical with ASTM D-244 60 except that distilled water shall be used in place of two percent sodium oleate solution.

⁴Test procedure is attached.

⁵Chemical composition by ASTM Method D-2006-70:

PC = Polar Compounds, A₁ = First Acidaffins.
A₂ = Second Acidaffins, S = Saturated Hydrocarbons.

Note: For gal/ton conversion use 242 gal/ton.

Note: Data presented are typical. Slight variation may occur from lot to lot.



800-333-6309

www.pavetechinc.com

Evaluation of Seal Coat Runway 16-34 Lajes Field, Azores

by
J. E. Pickett

Geotechnical Laboratory
U.S. Army Engineer Waterways Experiment Station
P.O. Box 631
Vicksburg, Mississippi

March 1983

Pavement Technology, Inc.
Preventive Maintenance Specialists

24144 Detroit Rd.
Westlake, OH 44145
1-800-333-6309



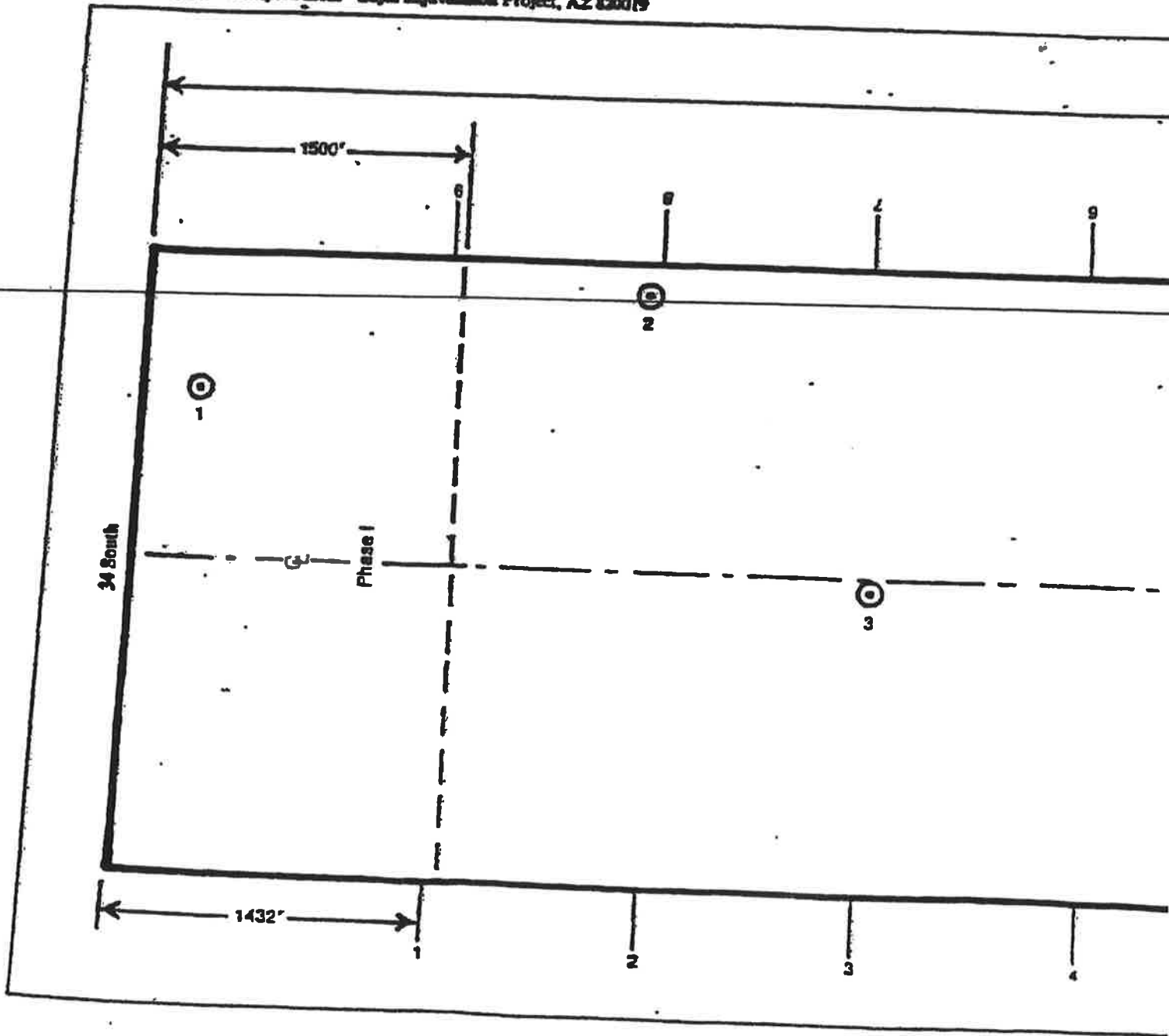
1. In February 1983, the Pavement Systems Division, Geotechnical Laboratory, U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi, was requested by the 1605th Air Base Wing (MAC), Lajes Field, Azores, to provide technical assistance and construction inspection of the rejuvenator project on Runway 16-34, which included sampling and laboratory testing. Treatment of the runway was per-

formed 10-15 March. An excess of Reclamite remaining from projects in 1979 and 1983 was used to treat some parking aprons and taxiway

2. Messrs. Jack E. Pickett and James E. Schoenberger traveled to Lajes Field on 28 February 1983 to take samples before and after treatment and to observe the rejuvenator application.

3. The 10,864-ft runway was divided into sections and treated in three phases. This was

Incl 1 Layout of sampled areas Lajes Rejuvenation Project, AZ 620019



done so the runway could remain open to traffic during treatment. Before treatment, one set of three 6-in. cores were taken at each of eight locations, selected at random throughout the runway, two sets from Phase I and three sets each from Phases II and III. Core locations are shown on Incl I. After treatment, three additional cores were taken at each location within 2 to 4 ft of the original core locations and in the same construction lane.

The samples were processed by sawing 3/8 of material from the upper surface. The asphalt was extracted from this 3/8-in.-thick sample and recovered; untreated samples were processed at the field laboratory at Lajes. The recovered asphalt and treated samples were returned to WES for processing and penetration and viscosity testing. Results of these laboratory tests are summarized in Table I. Test results indicate the rejuvenation of

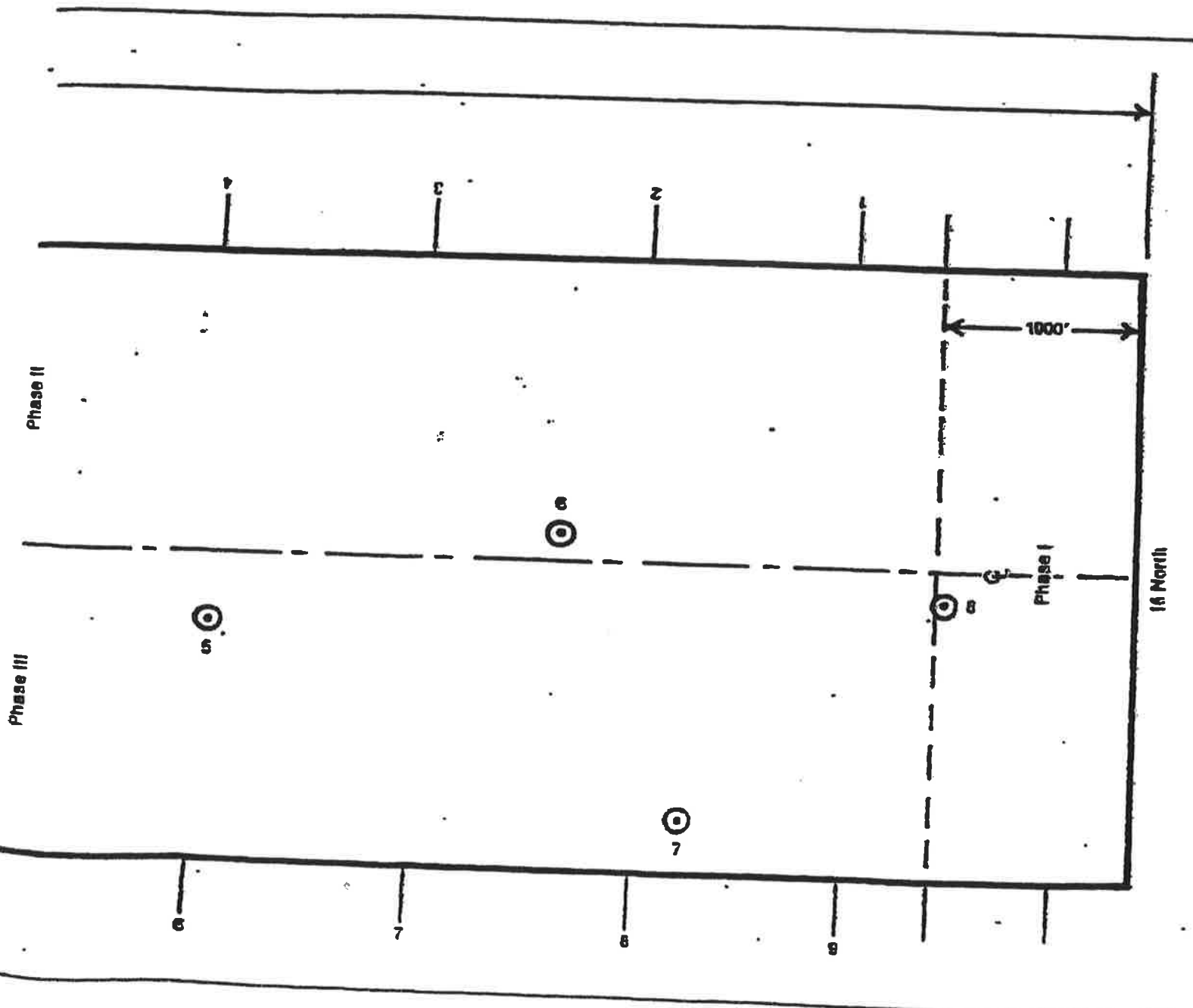


Table I

Lajes Rejuvenator, 1983

Sample Number	Station From South End R/W & C	Penetration 77°F (25°C) 100 g, 5 sec 0.1 mm		Absolute Viscosity 140°F (60°C) 300.0 mm Hg Vacuum, Folbes	
		Untreated	Treated	Untreated	Treated
1	2+43, 83.7 ft W	11.00	20.00	401,351	65,420
2	23+55, 134.9 ft W	11.00	23.00	449,520	62,011
3	34+34, 5.1 ft E	13.00	31.00	242,293	32,860
4	52+07, 51.3 ft W	9.00	27.00	1,852,362	43,497
5	64+36, 32.4 ft E	4.00	17.00	2,774,367	177,941
6	80+67, 14.6 ft W	9.00	22.00	863,971	62,736
7	86+86, 121.4 ft E	6.00	34.00	1,263,880	23,444
8	99+17, 17 ft E	6.00	29.00	1,318,687	41,392
Average		8.63	25.38	1,145,804	63,663
Change (%)		Penetration	194.00	Viscosity	94.40
			Increase		Decrease

Runway 16-34 was satisfactory. The penetration test shows an increase of approximately 194 percent and the viscosity test shows a decrease of approximately 94 percent. The specification requires the average penetration to be increased by 20 percent and the average viscosity to be decreased by 40 percent.

4. The contractor for the project was Mr. Colin M. Durante, Pavement Technology, Inc., 11260 Berett Road, Cleveland, Ohio 44102. He elected to use Reclamite, a proprietary material manufactured by the Golden Bear Division of Witco Chemical Corporation, Bakersfield, California, as a rejuvenator. Reclamite is a resin-based emulsion that leaves an oily residue and is applied with a bituminous distributor. The Reclamite material was mixed at the job site in a two to one ratio with water, two parts Reclamite to one part water. The Reclamite mixture at ambient temperature (60-70°F) was sprayed onto the runway pavement by using a 1140 gal bituminous distributor equipped with a 10-ft spray bar. Application rates were varied intentionally to avoid excess rejuvenator in areas,

such as recently patched areas, and areas with rubber build-up. Areas outside regular traffic were sprayed heavier, which would not bother air traffic, in case of excess rejuvenator on the surface. Dates of treatment and application rates (gal/yd²) are shown in Table II. The remainder of the material was used to spray various taxiways and parking aprons.

Table II

Phase I	
Center 100-ft-wide area	0.053 gal/sq yd
All other areas	0.061 gal/sq yd
Phase II	
From center line runway out 50 ft	0.055 gal/sq yd
All other areas	0.066 gal/sq yd
Phase III	
From center line runway out 50 ft	0.058 gal/sq yd
All other areas	0.074 gal/sq yd

Jack E. Pickett
Materials Engineering Technician
Pavement Systems Division
Geotechnical Laboratory

Construction seal.



Reclamite was used as a construction seal. For comparison, the lower left area was not treated.



Reclamite was used as a construction seal on the dry areas of this pavement. Untreated areas are still wet from water penetrating the surface.



Reclamite was used as a construction seal on the dry areas of the pavement.

Penetration values of asphalt extracted from cores (New Mexico Highway Department).

Core	Reclamite treated (2 years)	
	Depth	Value
1	Top 1/2"	52
2	Top 1/2"	48
3	Top 1/2"	40
Untreated		
4	Top 1/2"	17
5	Top 1/2"	23
6	Top 1/2"	22

Penetration values of asphalt extracted from cores (Douglas Street, Kern County, Calif.).

Depth	Reclamite treated	
	6 mos.	30 mos.
Top 1/2"	37	25
Untreated		
Top 1/2"	18	13

Penetration values of asphalt on cores taken at intervals over period of time (Day Street, Kern County, Calif.).

Depth	Reclamite treated		
	2 mos.	18 mos.	36 mos.
Top 1/2"	82	48	40
Untreated			
Top 1/2"	23	19	16

Customer: Pavement Technology, Inc. - Colin Durante, John Schlegel

Project: Charleston County, South Carolina - 2015 Reclamite Application

Samples Submitted: Sixteen core samples (8 untreated and 8 treated with RECLAMITE 8) identified as:

Forest Trail, Halsey Boulevard, Patterson Avenue, South Rhettt Avenue, Shadowmoss Parkway, Algon Quin Road, Queen Street, Wingo Way

Requested Testing:

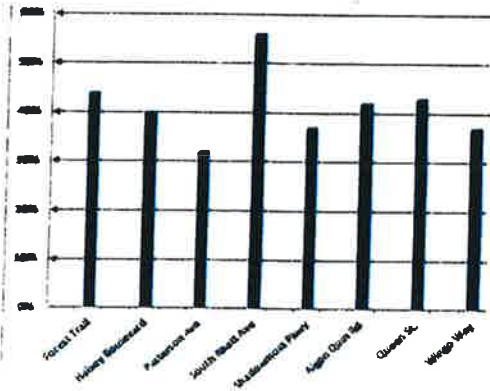
Determine the Dynamic Shear Rheological properties at 60° C of the recovered asphalt binder from the top 3/8-inch layer of each core. These properties include viscosity, phase angle, complex, elastic, and viscous moduli.

Summary of Testing:

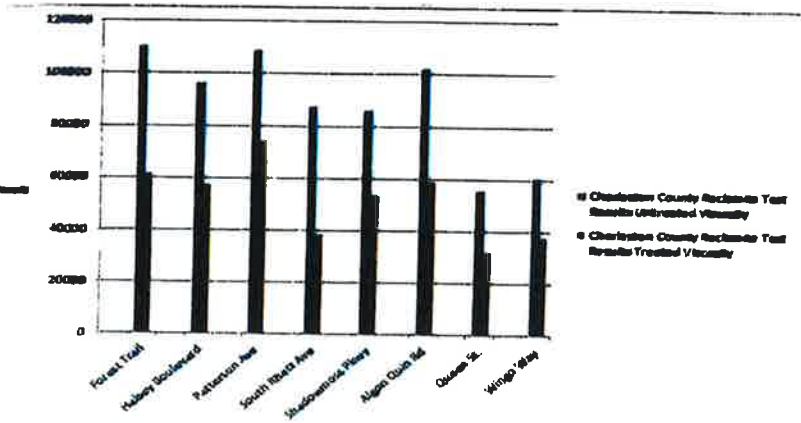
The top 3/8-inch of each core was removed for testing. The asphalt was extracted and recovered as prescribed by California Test Method 365. Viscosity and phase angle, as well as, complex, elastic, and viscous moduli were determined on the recovered asphalt binder using Dynamic Shear Rheology as prescribed by AASHTO T315. Test results are reported by Table I.

Sample Identification	Viscosity 60°C, Poises	Phase Angle, °	MODULUS, 60°C, Pa		
			Complex	Elastic	Viscous
Forest Trail					
Untreated	110430	57.8	110720	59055	93450
Treated	61394	68.9	61556	22166	57427
	44% decrease				
Halsey Boulevard					
Untreated	96417	65.8	96672	39979	80190
Treated	57450	69.1	57601	20072	53002
	40% decrease				
Patterson Avenue					
Untreated	100930	65.5	100220	45355	99350
Treated	74116	67.5	74311	28497	68646
	32% decrease				
South Rhettt Avenue					
Untreated	87271	66.9	87501	34302	80490
Treated	38007	70.8	38999	12707	30740
	55% decrease				
Shadowmoss Parkway					
Untreated	85824	67.5	86024	37073	80729
Treated	53725	69.6	53892	23267	49505
	37% decrease				
Algon Quin Road					
Untreated	102100	64.7	102370	43770	92530
Treated	58971	68.4	59126	21700	54060
	42% decrease				
Queen Street					
Untreated	55747	59.9	55807	33013	49677
Treated	32020	70.2	32150	17667	29074
	42% decrease				
Wingo Way					
Untreated	60444	68.2	60624	22522	50205
Treated	37962	70.1	37962	10947	32096
	37% decrease				

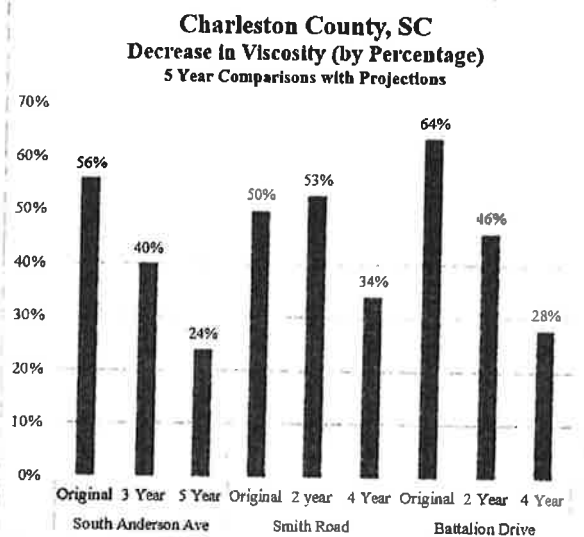
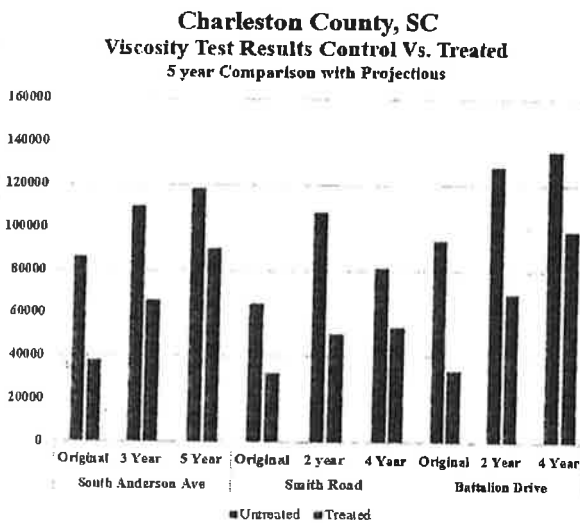
Charleston County, South Carolina
Reclamite Application 2015
Change in Viscosity Results



Charleston County, South Carolina
Reclamite Application 2015
Viscosity Test Results Control vs. Treated



Sample Identification	Viscosity 60° C, Poises		
	Original	3 Year	5 Year
South Anderson Avenue			
Untreated	86177	109950	118490
Treated	38220	66424	90198
Percentage Decrease	56%	40%	24%
	Original	2 Year	4 Year
Smith Road			
Untreated	64993	107220	81289
Treated	32426	50643	53746
Percentage Decrease	50%	53%	34%
	Original	2 Year	4 Year
Battalion Drive			
Untreated	94533	128750	136340
Treated	33743	69437	98896
Percentage Decrease	64%	46%	28%



PAVEMENT TECHNOLOGY INC.

24144 DETROIT ROAD
WESTLAKE, OHIO 44145
(440) 892-1895
(800) 333-6309
FAX (440) 892-0953

Asphalt Recycling & Preventive Maintenance Specialists

Experience Outline

Operations and Fleet Manager – David Clark

1994 – 1995	Studied at Alfred State College, New York – Associate in Automotive Trades – Heavy Equipment, Truck and Diesel
1995 – 1997	Worked at a hazardous waste incineration plant / fork life and OSHA training certificates
1997 – 1999	Foundry work / furnace operator specialized in copper and brass.
1999 – Present	Pavement Technology, Inc., Westlake, Ohio
1999 – 2000	General laborer / driver – rejuvenating agent and crack sealing roadways
2000 – 2004	General supervisor in charge of rejuvenating agent application, crack sealing and other miscellaneous road construction work.
2004 – 2015	Fleet Manager in charge of all repairs and scheduling repairs for all trucks and equipment
2015 – 2017	Operations and Fleet Manager – in charge of scheduling crews and day to day operations.
2017 – Present	ATSSA Certified, OSHA 30 Compliant

A.R.A.-1Ti[®] Submittals

**Lexington Fayette Urban County Government
Invitation to Bid
#52-2023**



Pavement Technology, Inc.

May 9, 2023

the National Ambient Air Quality Standards (NAAQS) for airborne pollution inventory minimums, and Urban Heat Islands.

The near-road microenvironment (ME) is a significant area of policy and practice concern for modern urban planners, regulators and sustainability managers. Emissions from cars and trucks are a major source of greenhouse gases (GHGs) and the primary source for anthropogenic airborne toxins, such as nitrous oxides (NO_x) and volatile organic compounds (VOCs), that form the nucleus of unhealthy photochemical smog.

The combined action of urbanization (change in land use) and sharp increase in vehicular emissions intensifies both the build-up of GHGs in the air we breathe and the impact of heat sinks. The circular impacts from air pollution and UHI amplify related economic stresses on communities. In turn, GHG inventories accumulate, exaggerating linked atopic and other human disease.²

National Emissions Inventory (NEI) Data³ indicate motor vehicles operating on roadways emit on average 60% of ozone pollution (O₃), principally NO_x in the United States. In high-density metropolitan areas, vehicle-based emissions inventory trend closer to 70%, while total vehicle emissions in the United States has risen 102% since 1990 overall and 33% per-person.⁴



In addition to poorer air quality and the escalating health burden, mobile-sourced pollution is contributing to the “western impacts”, including rising sea levels and warmer climates. For example, intensified El Niño effects are resulting in exaggerated precipitation and incidence of both coastal and inland flooding in the eastern United States. So, management and mitigation of vehicular emissions is of critical import to both state and local government as well as regulatory agencies.

² Swamy G, et al., *Urban Heat Island (UHI) Influence on Secondary Pollutant Formation in a Tropical Humid Environment*, www.PubMed.gov.

³ U.S. Environmental Protection Agency (EPA): National Emissions Inventory (NEI), www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei.

⁴ Boston University: Database of Road Transportation Emissions and *The New York Times*, October 2019.

NO_x is the primary component of O₃ or “urban smog”. It’s a class of gaseous pollutants generated during high temperature processes of internal combustion engines and consists of nitric oxide (NO) and nitrogen dioxide (NO₂). NO₂ is considered among the most dangerous air pollutants impacting human health and the environment and is one of six Criteria Air Pollutants (CAPs) as defined under the NAAQS.

Photocatalytic oxidation (PCO) of NO_x using topical spray materials containing **titanium dioxide (TiO₂)** for roadway applications is a novel technology for mitigating urban smog. It’s been researched and tested broadly, especially in Europe. While the success rate for PCO efficiency of TiO₂ solutions has been consistently encouraging,^{5 6} prevailing techniques for both the development and application of TiO₂ compounds have proven not durable or economical.

In 2017 (and 2018), PTI applied the first field tests for *durable* TiO₂ solutions in Greenville (SC) and Orlando (FL). The technological breakthrough combined proven surface penetrating pavement preservation compounds, long utilized in Charleston County and elsewhere, fortified with photocatalyst grade TiO₂, to impregnate pavements with the natural pollution-reducing and heat reflecting material. The PTI technique provides both a method for sustainable TiO₂ delivery into pavement wearing-course depth and at cost-effective “retrofit” economics. The practice promotes an efficient and scalable application for solar-based, direct capture technology for O₃ precursors in the near-road environment.

Titanium is an amazing material. It’s as strong as steel, yet a fraction of its weight and much more durable. TiO₂ is a natural mineral whose atypical chemical properties have led to a diverse range of commercial and industrial uses from whitening additives in paints to food coloring, candy coatings, toothpaste and reflective sunscreens, etc., or as surface ‘wetting’ (i.e., hydrophilic) and anti-fogging agents, or as photo-reactive chemical catalysts.⁷

As a photocatalyst, TiO₂ is a multifaceted photo-responsive material⁸ rapidly gaining increased scientific and commercial interest for near-roadway MEs as it may advance a host of positive environmental and ecological benefits, including:

- **Depolluting** near-pavement air (or water) cleaning applications, where TiO₂ reacted surfaces are able to oxidize a variety of pollutants and contaminants such as those emitted by vehicles, especially NO_x and VOCs, **reducing ozone pollution** and **mitigating acid rain** formation
- **“Cool Pavement”** applications where TiO₂ treated surfaces provide a solar-reflective top boundary, which lessens pavement related radiative forcing (RF) by **reducing** the convective re-release or pavement emissivity of solar radiation that leads to the **undesired UHI effects** and enhances the life-cycle assessment of pavements by **slowing-down oxidation**⁹
- **Super-Hydrophilic** surfaces, which provide a rapid water-desorbing pavement, which is self-cleaning to remove contaminants (e.g., mold) and staining; and is indicated for inclement **weather-related safety** (rain displacing; ice inhibiting) improvements for roadways¹⁰

⁵ Dios J, et al., *Decontamination through Photocatalytic TiO₂ Additions – Past, Present and Future*, International Conference on Emerging Trends in Engineering and Technology (ICETET), London 2014.

⁶ Gopalakrishnan K, et al., *Climate Change, Energy, Sustainability, and Pavements*, Springer, 2014.

⁷ Gopalakrishnan K, et al.

⁸ *Polymers, Light and the Science of TiO₂*, DuPont™ Ti-Pure® Titanium Dioxide, DowDuPont, www.dow-dupont.com.

⁹ Gopalakrishnan K, et al.

¹⁰ Arainpour F and Farzaneh M, On Hydrophobic and Icephobic Properties of TiO₂-Doped Silicon Rubber Coatings, Department of Applied Sciences, Universite du Quebec, *International Journal of Theoretical and Applied Nanotechnology*, 2012.

With a half century of experience introducing chemical technologies to pavements, PTI's photocatalytic solutions are designed to deeply penetrate pavement surfaces to deliver nanoparticle, photocatalyst TiO_2 into depth at optimal load for sustained PCO and UHI mitigation. The product stock can be applied to almost any asphalt or concrete substrate using PTI's advanced application apparatus and at a fraction of the costs to more archival means to clean air, reduce heat build and extend infrastructure life cycle.

PTI is very excited about this new, quantified technology which cleans our air and helps manage heat islands as government agencies begin to deploy these **"smog-eating"** pavement solutions at both biologic and economic scale.



PHOTOCATALYTIC PAVEMENTS

1.1 Photocatalysis with TiO₂

Photocatalysis with titanium dioxide (TiO₂) is a known solar energy-based mechanism for air purification, solar reflectance and improved hydrophilicity.

Nanoparticle TiO₂ is an efficient semiconductor material for converting ultraviolet (UV) spectrum light into chemo-electric power. Light energized TiO₂ attracts both humidity (H₂O) and oxygen (O₂) in the air and splits them to create two powerful oxidants in the form of hydroxyl radicals (OH⁻) and superoxide(s) (O₂⁻).

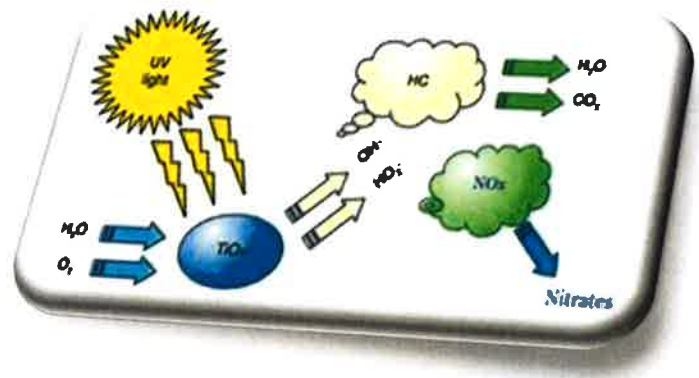
When in contact, these *radicals* and *oxides* combine with or “attack” adsorbed molecules (e.g., pollutants and other “polarized”¹¹ molecules), altering their structure and even molecular phase. The effect is to decompose the alien molecule, where the transfer of electrons between chemical species is a natural occurrence and merely accelerated by the catalyst TiO₂. The process is referred to as Disproportionation Redox (oxidation-reduction) or just - “redox”.^{12 13 14 15}

A TiO₂-bearing surface, e.g., a roadway, in the presence of ambient sunlight, creates *in effect* an “**electrochemical energy field**”. This charged surface promotes the degradation of certain transgressing particles, including hazardous air pollutants (HAPs) such as NO_x, and other O₃ precursors, including VOCs, that are captured traveling near and through (adsorbed to) the “photo-reacted” surface.

In the case of NO_x, TiO₂, acting as a ‘redox agent’, breaks-down via PCO the toxic airborne nitrite gases (NO₂) into harmless nitrate solid (“salt”) or HNO₃, which is easily absorbed by

vegetation or mechanically managed (filters), removing the airborne threat (**Drawing 1.1**).

Drawing 1.1 Photo-induced Redox with TiO₂



Source: The National Titanium Dioxide Company Limited

The U.S. Environmental Protection Agency (EPA) sets **airborne nitrites** at **849x more toxic** than even fully desorbed nitrates.¹⁶ So the conversion is not just a net reduction by quantity, but a *greater than 800 to 1* reduction by relative toxicity. EPA also sets **NO_x** at **298 carbon dioxide equivalents (CO₂e)**, making, the removal of NO_x of inordinate benefit to human health, ecology and climate management.

Consequently, the environmental science community is keenly interested in construction materials enhanced with titanium dioxide to be employed in our *built environment*.

Light activated TiO₂-bearing pavements create this electrochemical energy field described and can efficiently remove airborne HAPs originating from vehicular exhaust, promoting an effective system for reducing mobile-sourced pollution at

¹¹ A polarized or “bent” molecule has an uneven distribution of electron density, thus easily oxidized. Examples include H₂O and NO₂.

¹² Ohama Y and Gemert D, *Application of Titanium Dioxide Photocatalysis to Construction Materials*, Springer, 2011.

¹³ Hamilton Thorne, Inc.

¹⁴ Lie Y and Chen X, *Semiconductors for Photocatalysis*, Elsevier, 2017.

¹⁵ Disproportionation is a chemical reaction, typically a redox reaction, where a molecule is transformed into two or more dissimilar products.

¹⁶ EPA: National Ambient Air Quality Standards (NAAQS) for NO₂ and water contamination limits for HNO₃, www.epa.gov.

its inceptive and most vulnerable point of contact at the very road surface.^{17 18}

1.2 Smog-Eating Roads

PTI installed the world’s first durable TiO₂ retrofit photocatalytic pavements at Greenville (SC) and Orlando (FL) in late 2017 and early 2018.

Based on the Greenville and Orlando successes (Table 1.1),¹⁹ more refined applications of these new solutions have been deployed in the field as pilot projects in Austin (TX), Charlotte County

(FL), Greater Raleigh (NC), Bartow (FL) [FDOT test], and at Orlando International Airport (MCO). Recently, Cincinnati (OH) placed the first ever public bid for these materials.

The Texas A&M Transportation Institute (TTI) has tested field cores from the pilot sites using standardized photocatalytic materials testing protocols for PCO.²⁰ TTI testing indicates consistently strong NO_x reduction at all sites tested and over multiple years on the oldest sites (Tables 1.1-1.4).

Table 1.1 Multi-year NO_x Reduction Testing – Orlando (FL) and Greenville (SC)

A.R.A.-1 Ti[®]

Site	NO Reduction Efficiency (%)				
	Control Sample	Y1 Sample A	Y2 Sample A	Y1 Sample B	Y2 Sample B
0.04 – 0.06 g/y Light TiO ₂					
Orlando (FL)	NEGL	28%	33%	34%	30%
Greenville (SC)	NEGL	38%	35%	43%	38%

Source: Texas A&M Transportation Institute (TTI)

Table 1.2 NO_x Reduction – Orlando International Airport and Charlotte County (FL)

Site	NO Reduction Efficiency (%)				
	Control Sample	A.R.A.-1 Ti [®] Sample A	A.R.A.-1 Ti [®] Sample B	Litho1000Ti [®] Sample A	Litho1000Ti [®] Sample B
0.08 g/y > TiO ₂					
Orlando International	NEGL	45%	43%	53%	57%
Charlotte Co. (FL)	NEGL			42%	46%

Source: Texas A&M Transportation Institute (TTI)

¹⁷ Hassan M and Dylla HL et al., *Durability and Performance of Titanium Dioxide in Photocatalytic Pavements*, Louisiana State University, 2013.

¹⁸ Dios J, et al., *Decontamination through Photocatalytic TiO₂ Additions – Past, Present and Future*, International Conference on Emerging Trends in Engineering and Technology (ICETET), London 2014.

¹⁹ Zollinger DG and Joshaghani A, *Laboratory Investigation of the Effect of TiO₂ Topical Treatments on Concrete and Asphalt Samples*, Texas A&M Transportation Institute, September 2018.

²⁰ Japanese Industrial Standard (JIS) TR Z 0018 *Photocatalytic Materials – Air Purification Test Procedure*.

Table 1.2 (Cont.) NO_x Reduction – Orlando International Airport and Charlotte County (FL)

		Ti-introCME™ Concrete Sample A	Ti-introCME™ Concrete Sample B	Ti-introCME™ Asphalt Sample A	Ti-introCME™ Asphalt Sample B
Charlotte Co. (FL)	NEGL	48%	47%	49%	50%

Source: Texas A&M Transportation Institute (TTI)

Table 1.3 NO_x Reduction – Greater Raleigh [Cary] (NC)

Site	NO Reduction Efficiency (%)				
	Control Sample	0.08 gsy Sample A	0.08 gsy Sample B	0.07 gsy Sample A	0.07 gsy Sample B
Cary, NC	NEGL	46%	45%	42%	44%

Source: Texas A&M Transportation Institute (TTI)

Table 1.4 NO_x Reduction – TTI Test at the Center for Infrastructure Renewal (CIR)

Compound	NO Reduction Efficiency (%)					
	Control Sample	0.05 gsy	0.06 gsy	0.08 gsy	0.10 gsy	0.12 gsy
A.R.A.-1 Ti®	NEGL	53%	57%	61%	53%	48%
Ti-introCME™	NEGL	48%	52%	55%	58%	53%

Application Rate	NO Reduction Efficiency (%)			
	0.04 gsy	0.06 gsy	0.10 gsy	
Litho 1000 Ti®	NEGL	46%	55%	48%

Source: Texas A&M Transportation Institute (TTI)

Texas A&M also has tested the pilot sites for TiO₂ penetration (durability) and load optimization (PCO efficiency) through ‘wearing-course’ depth (0 to 6 mm)²¹ using x-ray fluorescence analysis (Figure 1.2).^{22 23}

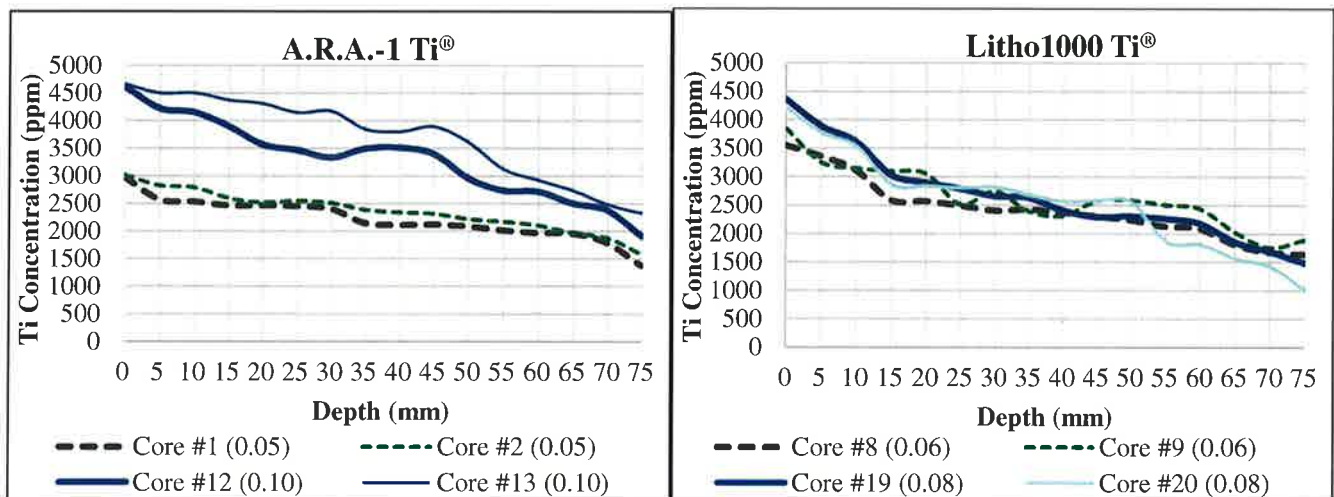
Due, in large part, to previously proven penetrant technology, PTI test sites consistently indicate deep penetration of the photocatalyst material at efficient PCO concentrations (> 2000 ppm) as deep as 50 mm (2 inches) or 8x AASHTO wearing-course depth.

The high TiO₂ presence at wearing-course depth is why the NO_x reduction figures are consistently strong. Penetration and reliable load optimization of the TiO₂ is the key to the significant

technological advancement with Pavement Technology’s photocatalytic pavement solutions. This was achieved by combining two proven nanotechnologies – known pavement preservation penetrating agents (e.g., MRT) and photocatalysis using photoreactive grade nanoparticle titanium dioxide.

Road-level NO_x capture and sequestration or “NO_x Capture” has been the principal advantage of PTI’s photocatalytic pavement solutions, with a product stock including A.R.A.-1 Ti® (asphalt), Litho1000 Ti® (concrete) and Ti-introCME™ (all substrates), which cover most or all transportation infrastructures and needs.

Figure 1.2 TiO₂ Penetration – Orlando International Airport



Source: Texas A&M Transportation Institute (TTI)

1.3 Acid Rain Mitigation with TiO₂ Treated Roads

Atmospheric deposition of nitrogen is a major source of nitrate found in watersheds and is addressed by various water-quality legislation. Specifically, because almost all of the sources of nitrogen contaminations are point sources, this form of pollution is best controlled by directly reducing nitrogen oxide emissions.

Commonly, these point sources are located outside of the political boundaries of watersheds that inherit this atmospheric deposited nitrogen and, therefore, may not be controlled through SCM regulations nor governance. Recent amendments to the CAA have mandated reductions to NO_x, including from mobile sources, as they are a critical factor in managing nitrogen levels impacting lakes, reservoirs, rivers and other estuarial expanses.

²¹ The American Association of State Highway and Transportation Officials (AASHTO) sets pavement wearing course depth at 0.25 inches.

²² Zollinger DG and Joshaghani A, September 2018.

²³ Zollinger DG and Joshaghani A, Follow-up, May 2019.

Vehicular emissions are the second largest source of nitrogen builds in watersheds, after agricultural sources, and can contribute as much as 40%²⁴ of nitrate levels in dense urban settings.

contaminations. So, photocatalytic pavements provide a preferred strategy for acid rain mitigation and direct reduction of watershed nitrogen builds.

The U.S. Geological Survey (USGS) recommends direct reduction strategies for mobile-sourced NO_x be employed to reduce such water

Table 1.5 Solar Reflectance – (a) Orlando International Airport and (b) Charlotte County (FL)

Compound / Substrate	Solar Reflectance Index Values (SRI)					
	Control Sample	Control Sample	0.10 gsy	0.10 gsy	0.08 gsy	0.08 gsy
Application Rate (a)						
A.R.A.-1 Ti[®] / Asphalt	9	8	40	39		
Litho1000 Ti[®] / Concrete	24	24			38	38
Application Rate (b)	Control Sample	0.03 gsy	0.06 gsy			
Ti-introCME™ / Asphalt	11	30	34			
Ti-introCME™ / Concrete	20	37	42			
Litho1000 Ti[®] / Concrete	25	41	46			

Source: Texas A&M Transportation Institute (TTI)

1.4 Cool Pavements with TiO₂

In 2019, TTI added testing for solar reflectance (UHI mitigation effectiveness), showing PTI test sites material and consistently exceed the threshold for **U.S. Green Building Council LEED** for heat island reduction (**Table 1.5**).^{25 26}

At Orlando International Airport, PTI solutions turned an almost perfectly absorptive asphalt parking ramp (FedEx terminal) with a **Solar Reflectance Index (SRI)** of 9 (out of 100) into a 39-40 or 40% more reflective than LEED requirements and **> 4x as heat energy displacing** as original, untreated asphalt.

As a heat mitigator, photocatalytic grade TiO₂ simultaneously absorbs solar radiation away from the pavement substrate and efficiently redirects the energy back into the atmosphere, thereby protecting the pavement from oxidative deterioration (LCA extension) and eliminating excess pavement emissivity (especially in asphalts), creating a so-called – **“cool pavement”** which greatly helps reduce UHI.²⁷

²⁴ U.S. Geological Survey’s National Water-Quality Assessment Program (NAWQA), www.usgs.com.

²⁵ Zollinger DG and Joshaghani A, *Solar Reflectance Analysis of TiO₂ Penetrant Treatments on Concrete and Asphalt Samples*, Texas A&M Transportation Institute, August 2019.

²⁶ U.S. Green Building Council USGBC), LEED V4 Heat Island Reduction (HIR) via Solar Reflectance Index (SRI) ≥ 50% 29, www.usgbc.org.

²⁷ EPA, *Reducing Urban Heat Islands: Compendium of Strategies, Urban Heat Island Basics*, www.epa.org.

1.5 Rapid Water Displacement of TiO₂ Surfaces

TiO₂-bearing pavements exhibit a **Photoinduced Superhydrophilicity State** (PSH) when exposed to UV radiation, which enables water to more efficiently disperse and desorb across a TiO₂-treated surface.^{28 29} This has significant highway safety improvement implications including reduced hydroplaning, less windshield visibility impairment, and possibly ice formation mitigation. It also is why TiO₂ treated surfaces are mechanically “self-cleaning” and both anti-mold and antimicrobial.³⁰

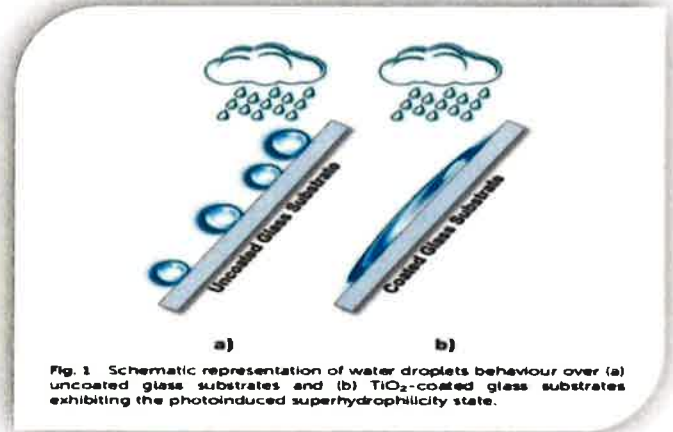
For example, the PTI test site at Orlando International exhibited significant mold removal within the first few months on the previously mentioned FedEx ramp treated with A.R.A.-1 Ti®.

Light energized TiO₂ strongly attracts water, which is naturally polarized, where the water molecules are split by the activated surface, resulting in vastly improved disposal of H₂O as it is transformed into thin films across the surface, not allowing droplets (and ponding) to form (**Drawing 1.3**).

This PSH or “quick drying” transition of a photocatalytic pavement surface can be observed by measuring water contact angle (WCA) before and after UV illumination,³¹ where a TiO₂-bearing surface presents a **contact angle** considerably **lower** when irradiated. This **accelerates the dispersion** of water across the

surface by as much as **5x** a non TiO₂-bearing or “inactive” surface.^{32 33}

Drawing 1.3 Super-Hydrophilic Surfaces Can Rapidly Displace Water



Source: Universidade do Porto (Portugal)

As with NO_x reduction, the “fully hydroxylated” TiO₂-bearing pavement³⁴ during photocatalysis causes powerful oxidants to combine with the adsorbed water molecules (e.g., rain) to form new hydrogen bonding with the H₂O clusters. This forces the distribution of these bonds within the water droplets to decrease, resulting in a **reduction of surface tension** between the water and the photoreactive TiO₂ surface.^{35 36}

²⁸ Mechanism of Photoinduced Superhydrophilicity on the Photocatalyst Surface, *The Journal of Physical Chemistry*, American Chemistry Society, 2005, Masato T, et al.

²⁹ Vassilia Z, *Hydrophilic TiO₂ Surface Without Photocatalytic Activation*, Lawrence Berkeley National Laboratory, University of California at Berkeley.

³⁰ Kubacka A, Suarez Diez M, et al., Understanding the Antimicrobial Mechanism of TiO₂- based Nanocomposite Films in a Pathogenic Bacterium, *Nature Journal*, 2014.

³¹ ASTM D7334 - 08(2013) *Standard Practice for Surface Wettability of Coatings, Substrates and Pigments by Advancing Contact Angle Measurement*.

³² Research Institute of Toto Ltd., Tokyo, Japan, 1995.

³³ Banerjee S, et al., *Self-Cleaning Applications of TiO₂ by Photo-Induced Hydrophilicity and Photocatalysis*, 2015.

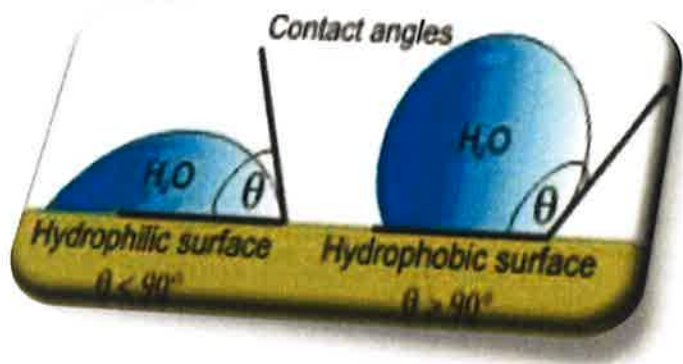
³⁴ Hydroxylation is a chemical process that introduces a hydroxyl group (-OH) into an organic compound and is the first step in oxidative degradation.

³⁵ Transparent Superhydrophobic/Superhydrophilic TiO₂-based Coatings for Self-Cleaning and Anti-fogging, *Journal of Materials Chemistry*, Royal Society of Chemistry, 2012.

³⁶ Masato T, Sakamoto K, et al., *Mechanism of Photoinduced Superhydrophilicity on the TiO₂ for Photocatalytic Surface*, Department of Chemistry, Graduate School of Engineering, Osaka Prefecture University, February 2005.

A WCA of less than 90 degrees is considered “hydrophilic” and will increasingly (with lower contact angle) speed-up the displacement of water (Drawing 1.4).

Drawing 1.4 Hydrophilic vs Hydrophobic Contact Angles



Source: London South Bank University

For example, in highway design, an open graded friction course (OGFC) is designed specifically to **physically reduce** water contact angle as **surface roughness** has a strong effect on wettability.

A photocatalytic pavement will be even more efficient at producing a hydrophilic outcome through its high electro-chemical energy transformation of water molecules as described, providing a measurable upgrade to the water desorbing efficiency of any pavement substrate.

PTI tested A.R.A.-1 Ti[®] on an OGFC in Bartow (FL) for the FDOT just recently. As indicated in (Table 1.6), the TiO₂ enhanced test section observed a material decline in WCA from 81-82 degrees to 50-51 degrees for a nearly 40% improvement in water displacement capability.

Table 1.6 Water Contact Angle – FDOT OGFC Test Bartow (FL)

Site	Water Contact Angle ^o				
	Control Sample	TiO ₂ 1 Visible Light	TiO ₂ 1 UV Light	TiO ₂ 2 Visible Light	TiO ₂ 2 UV Light
A.R.A.-1 Ti [®]					
FDOT Test	81°	82°	51°	81°	50°

Source: Texas A&M Transportation Institute (TTI)

In the Charlotte County (FL) trials, PTI tested both **Litho1000 Ti[®]** and **Ti-introCME™** across test sections for skid resistance (friction) under the standard testing protocol³⁷ which was executed by International Cybernetics (Table 1.7). The primary purpose for which was to determine skid resistance safety when applying TiO₂ enhanced

products to high speed thoroughfares. But what also was observed was clear indications of the instantaneous hydrophilic *effect* the TiO₂ imparted to the surface of the pavement.

³⁷ ASTM E247 / E274M-15 Standard Test Method for Skid Resistance of Paved Surfaces Using a Full-Scale Tire.

Table 1.7 TiO₂ Impact on Skid Resistance and Hydrophilic Implications

Litho1000 Ti[®]

Location / Rate gsy	Pre-Application	Post 20 Minutes	Post 24 Hours
Indian Trail WB / 0.03	43	41	44
Indian Trail WB / 0.06	43	47	50

Ti-introCME[™]

Location / Rate gsy	Pre-Application	Post 20 Minutes	Post 24 Hours
Alicante Drive EB / 0.03	58	61	61
Alicante Drive WB / 0.06	59	64	64
Indian Trail WB / 0.03	42	43	45
Indian Trail WB / 0.06	42	51	51

Source: International Cybernetics, Charlotte County (FL) March 2019

As exhibited, the surfaces treated with both **Litho1000 Ti[®]** and **Ti-introCME[™]** showed that friction was not adversely impacted in any of the tests and that in all six tests, skid resistance improved meaningfully. That friction results improved immediately (tested after just 20 minutes following application) and continued was insightful as it indicates the clear presence of the TiO₂ and a PSH.

To some, this may appear to be a startling outcome, especially considering the rather small amount of water used in the standardized friction test. But it is direct evidence of improved hydrophilic tendency of a road impregnated with photocatalyst grade TiO₂. While more research is indicated, under actual inclement weather conditions, one should expect the improved (relative) skid resistance for a TiO₂-bearing pavement to be even greater.

PTI's photocatalytic pavement solutions provide the Public Works profession the first method for sustainable TiO₂ delivery into pavement wearing-course depth and at cost-effective "retrofit" economics. The technique promotes an efficient, durable and scalable application for solar-based, "**NO_x Capture**" technology for the systematic removal of O₃ precursors, UHI mitigation, pavement infrastructure LCA extension, and improved roadway safety in the critical near-road environment.



STOP. LOOK. LEARN.

Pavement Technology, Inc.

Real Science. Real Results.

Achieve Up to 60% NOx Capture with Pollution-Reducing Photocatalytic Pavements

Pollution-removing and heat-reducing asphalt and concrete penetrants fortified with photocatalytic titanium dioxide (TiO₂), from Pavement Technology, Inc., reduce vehicular exhaust pollution and mitigate the effects of Urban Heat Islands (UHI). TiO₂-enhanced pavements create an air-purifying and solar-reflective top boundary that perpetually regenerates



itself throughout the life (LCA) of the pavement, resisting oxidative weathering and traffic-related wear, while materially contributing to compliance with the Clean Air Act (CAA) and U.S. EPA's stringent National Ambient Air Quality Standard (NAAQS). Technical assistance is available from the manufacturer and its trained field representatives.



Ti-intro CME® Application



Real Science.
Real Results.

PlusTi™
Smog Eating Roads

A Better Way to Get There

Pavement Technology, Inc.

800-333-6309

www.pavetechinc.com

A.R.A.-1 Ti® asphalt rejuvenator/sealer



PlusTi A.R.A.-1 Ti® asphalt rejuvenator/sealer application

The PlusTi™ family of smog-eating road penetrants includes A.R.A.-1 Ti® pollution-reducing asphalt rejuvenator/sealer. Formulated from the same maltene fractions that vitalize asphalt binders, A.R.A.-1 Ti asphalt rejuvenator/sealer revitalizes aging asphalt while leaving behind a self-cleaning surface that removes nitrogen oxides (NOx), volatile organic compounds and other pollutants introduced into the atmosphere through vehicular exhaust. The air-purifying surface regenerates itself, contributing to compliance with U.S. EPA's stringent new National Ambient Air Quality Standard (NAAQS). The ideal solution for government agencies dealing with reduced budgets, deteriorating infrastructures and pollution concerns.

Markets

- DOTs
- Urban/Suburban Municipalities, Counties, Gated Communities
- Airports
- Bridges
- Parking Lots
- Highway Shoulders

Compatible Substrates

- For newly constructed asphalt pavement, PlusTi asphalt rejuvenator/sealer improves durability by replacing volatile components lost to the heat of production, providing an in-depth seal to reduce permeability.

- For older asphalt pavement, PlusTi asphalt rejuvenator/sealer reverses the effects of UV, weathering and water intrusion by reintroducing volatile components deep into the asphalt to restore ductility and flexibility.

Benefits

- Penetrates deeply to protect against air and water – not a topical coating
- Provides a self-cleaning, self-regenerating, air-purifying surface that removes nitrogen oxides (NOx) volatile organic compounds (VOCs) and other airborne pollutants from the atmosphere for the life of the structure
- Captures and removes up to 60% of toxic airborne vehicular emissions
- Creates a quick-drying super-hydrophilic surface
- Prevents stripping and raveling of the aggregate
- Reduces long-term pavement maintenance costs by extending the life of new and existing asphalt pavements:
 - Increases the durability of the top portion of new asphalt pavements
 - Improves the ductility and flexibility of the top portion of aging asphalt pavements
- Will not obliterate striping and other markings
- Supports NAAQS compliance

How It Works

A.R.A.-1 Ti PlusTi asphalt rejuvenator/sealer uses Maltene Replacement Technology to restore the reactive components that asphalt

pavements lose due to hot-plant operations and the aging process. The emulsion uses Photo Catalytic Technology (PCT) to deliver TiO₂ deep into the asphalt surface, leaving behind a photo catalytic surface layer that removes NOx, volatile organic compounds (VOCs) and other airborne pollutants from the atmosphere for the life of the pavement. As weather and traffic wear the surface layers of pavements, deeper layers of TiO₂ are exposed at the surface in a self-generating process of air purification.

How to Apply

Temperature

Apply only when ambient temperature is expected to remain at or above 40°F during application and for the next 12 hours.

Surface Preparation

Surface must be dry with no threat of rain within 4 hours of application.

Field testing shall be performed prior to application to determine the maximum amount of material that the pavement can absorb within a 20 minute period. Contractor shall apply various test strips ranging in length from 100-150 ft. using different rates, noting the time it takes for total absorption to occur without surface residues remaining.

Application Method

PlusTi asphalt rejuvenator/sealer must be applied by an approved applicator using a computerized distributor truck cleaned of all other materials to prevent contamination.

Apply uniformly to all surfaces. Where grades / elevations are prone to excessive runoff, multiple applications may be required; successive applications must be made as soon as complete penetration of previous applications has occurred.

A light application of dry sand or rock dust shall be applied to all treated pavement after absorption and prior to reopening to traffic; if spills or misapplication occur, a heavier application may be required. The sand or rock dust should be removed within 24 hours.

(continued)



Reduced UHI – TiO₂-treated surfaces provide a solar-reflective top boundary that lessens pavement-related radiative forcing (RF) by reducing heat absorption and

the convective re-release (pavement emissivity) from solar radiation. The result is a genuinely “cool pavement” that mitigates Urban Heat Island (UHI) effects and extends the life-cycle (LCA) of pavements by slowing down oxidation.²



Rapid Water Displacement – TiO₂-enhanced pavements are super-hydrophilic, enabling rapid surface water release. The result is a pavement that is self-

cleaning, removing contaminants and preventing staining. The significantly enhanced hydrophilic properties are indicated for improved weather-related road safety by rapidly displacing rain and inhibiting ice formation.³

Product Stock

- A.R.A.-1 Ti[®] - Asphalt
- Litho1000Ti[®] - Concrete
- Ti-intro CME[®] - All Substrates

Markets

- Urban/Suburban Municipalities and Counties
- DOTs
- Airports

Compatible Substrates

Asphalt and Concrete surfaces of any age, including:

- Pavements
- Bridge Decks
- Tunnels
- Parapet Walls
- Parking Structures



PTI, with a half century of experience introducing nano-chemical technologies to pavements, has developed photocatalytic solutions that deeply penetrate pavement surfaces to deliver photocatalytic grade TiO₂ into depth at optimal load for sustained photo-oxidation of pollutants and UHI mitigation.

The product stock can be applied to almost any asphalt or concrete substrate using PTI's advanced application apparatus, and at a fraction of the cost of more archival means to clean air, reduce heat build and extend infrastructure life cycle.

**For more information contact Michael Durante,
MDurante@pavetechinc.com**

Manufacturer and National Distributor

D&D Emulsions, Inc., Mansfield, OH
Pavement Technology, Inc., Westlake, OH

¹ *Polymers, Light and the Science of TiO₂, DuPont™ Ti-Pure® Titanium Dioxide, Dow DuPont, www.dow-duPont.com.*

² *Gopalakrishnan K, et al., Climate Change, Energy, Sustainability, and Pavements, Springer, 2014.*

³ *Arainpour F and Farzaneh M, On Hydrophobic and Icephobic Properties of TiO₂-Doped Silicon Rubber Coatings, Department of Applied Sciences, Universite du Quebec, International Journal of Theoretical and Applied Nanotechnology, 2012.*

SAFETY DATA SHEET



PluSTi™
Smog Eating Roads
A Better Way to Get There

1. Identification

Product identifier A.R.A.-1 Ti®
Other means of identification Photocatalytic Maltene Rejuvenator
Recommended use Pollution-Reducing and UHI Mitigating Pavement Penetrant and Asphalt Rejuvenator
Recommended restrictions Follow the manufacturer's instructions.
Manufacturer/Importer/Supplier/Distributor information
Manufacturer
Manufacturer: D & D Emulsions, Inc.
Address: 270 Park Avenue East
P.O. Box 1706
Mansfield, OH 44901
24- Hour Telephone Number:
CHEMTREC: 1-800-424-9300 (USA and Canada)
CCN794154



2. Hazard(s) identification

Physical hazards Not classified
Health hazards Not classified
Environmental hazards Not classified
OSHA defined hazards Not classified

Label elements

Signal word None
Hazard statement None
Precautionary statement Do not handle until all safety precautions have been read and understood.
Storage Store in accordance with international regulations. Store locked up.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC) None known
Supplemental information Not applicable

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
PETROLEUM MALTENE EXTRACT (>99%)	Maltene Rejuvenator	N/A	60 – 65
WATER		7732-18-5	35 – 40
TITANIUM DIOXIDE	Photocatalytic Semiconductor	13463-67-7	<5
PROPRIETARY INGREDIENTS*		N/A	<5

*Designates that a specific chemical process or identity of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact Rinse with water. Get medical attention if irritation develops and persists.
Ingestion Rinse mouth. Do not induce vomiting without advice from poison control center.

Most important symptoms /effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Dry chemicals. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire-fighting equipment/ instructions	Cool containers exposed to heat with water spray and remove container if no risk is involved.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	<p>Large Spills: Stop the flow of material if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.</p> <p>Small Spills: Wipe up with absorbent material (e.g., cloth, fleece). Clean surface thoroughly to remove residual contamination.</p> <p>Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.</p>
Environmental precautions	Avoid unintentional discharge. Clean up accordingly.

7. Handling and storage

Precautions for safe handling	Avoid prolonged or repeated contact with skin. Avoid prolonged exposure. Use only in well-ventilated areas.
Conditions for safe storage, including any incompatibilities	Keep away from heat and sources of ignition. Store in original tightly closed container. Store away from incompatible materials (see section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
SIMILAR CHEMICALS*	PEL	5 mg/m3	Mist.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
SIMILAR CHEMICALS*	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

*A.R.A. -1 Ti® is made from a sufficiently refined petroleum extract; Exposure limits based on similar but potentially insufficiently refined petroleum products.

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles).
Hand protection	Wear protective gloves.
Skin protection	
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	Not available
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Opaque Liquid
Physical state	Liquid
Form	Liquid
Color	Yellow
Odor	Mild Odor
Odor threshold	Not available
pH	4.5 – 7.2
Melting point/freezing point	Not available
Initial boiling point and boiling range	> 212 °F (> 100 °C) estimated
Flash point	> 413 °F (> 212 °C) estimated
Evaporation rate	< 1
Flammability (solid, gas)	Not available
Upper/lower flammability or explosive limits	
Flammability limit – lower (%)	Not available
Flammability limit - upper (%)	Not available
Explosive limit – lower (%)	Not available
Explosive limit – upper (%)	Not available
Vapor pressure	Not available
Vapor density	Not available
Relative density	1 g/cm3
Solubility (ies)	
Solubility (water)	Readily Dispersible
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	500 °F (260 °C) estimated
Decomposition temperature	Not available
Viscosity	Not available
Other information	
Percent volatile	≤63% (105 °C) estimated
VOC (Weight %)	Not applicable

10. Stability and reactivity

Reactivity	Product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure	
Ingestion	Expected to be a low or no ingestion hazard.
Inhalation	No data available to indicate product or any components present at greater than 0.1% pose inhalation risk.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation.
Information on toxicological effects	
Acute toxicity	No data available to indicate product or any components present at greater than 0.1% pose toxicity risk.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization	
Respiratory sensitization	No data available to indicate product or any components present at greater than 0.1% pose respiratory sensitization.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classified.

A.R.A.-1 Ti® is made from a sufficiently refined petroleum extract that, in independent laboratory testing, contains no classified ingredients (>BDL) under EPA 8207C or listed as known or potential carcinogenic agents per ACGIH, NTP, OSHA, IARC or California Prop 65. Source titanium dioxide is a fumed material that are small particles, but they are presented in small quantity and NOT in a form where they are airborne in **A.R.A.-1 Ti®**. The conditions where labeling under Prop 65 is required is when the TiO₂ particles are airborne, respirable and not bound in a matrix. Additionally, the International Agency for Research on Cancer (IARC) recognizes that "no significant exposure to primary particles in titanium dioxide is thought to occur during the use of products in which titanium dioxide is bound to other materials, such as in paints."

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Not Listed

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity	Not classified
- single exposure	
Specific target organ toxicity	Not classified
- repeated exposure	
Aspiration hazard	Not available; Not Expected.
Chronic effects	Not available; Not Expected.

12. Ecological information

Ecotoxicity	Product is not classified as environmentally hazardous.
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this product.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues/unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions)
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT	Not regulated as dangerous goods.
IATA	Not regulated as dangerous goods.
IMDG	Not regulated as dangerous goods.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available

15. Regulatory information

US federal regulations	All components are on the U.S. EPA TSCA Inventory list.
TSCA Section 12 (b) Export Notification (40 CFR 707, Subpt. D)	Not regulated
CERCLA Hazardous Substance List (40 CFR 302.4)	Not listed
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	Not listed
Superfund Amendments and Reauthorization Act of 1986 (SARA)	
Hazard categories	Immediate Hazard – No Delayed Hazard – Not known Fire Hazard – No Pressure Hazard – No Reactivity Hazard – No
SARA 302 Extremely hazardous substance	Not listed
SARA 311/312	No
Hazardous chemical SARA 313 (TRI reporting)	Not regulated
Other federal regulations	
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) list	Not regulated
Clean Air Act (CAA) Section 112 (r)	
Accidental Release Prevention (40 CFR 68.130)	Not regulated
Safe Drinking Water Act (SDWA) (SDWA)	Not regulated

US state regulations

US. Massachusetts RTK – Substance List	Similar chemicals*
US. New Jersey Worker and Community Right-to-Know Act	Not regulated
US. Pennsylvania RTK – Hazardous Substances	Similar chemicals*
US. Rhode Island RTK	Not regulated
US. California Proposition 65	Similar chemicals*

*A.R.A.-1 Ti® is made from a sufficiently refined petroleum extract. Disclosure here is not based on A.R.A.-1 Ti®, but similar and potentially insufficiently refined petroleum products. The listing requirements of the Right to Know (RTK) legislation varies by state. All actionable information for NJ, PA, MA, CA and other states can be derived from the listing of hazardous and non-hazardous components in section 2 and 15 of this SDS.

International Inventories

Country (s) or region	Inventory name	On inventory (yes / no) *
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from this listing on the inventory administered by the governing country(s).

NFPA Ratings

Health:	0
Flammability:	0
Reactivity:	0

16. Other information, including date of preparation or last revision

Issue date	02-22-2021
Version #	01

Disclaimer

The information provided in this Safety Data Sheet is correct and based upon independent laboratory testing and other information, knowledge, and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

POLLUTION-REMIEDIATING POLYMERIZED PETROLIUM MALTENE ASPHALT REJUVENATION

335-1 Description.

The work specified in this section shall consist of furnishing all labor, material, and equipment necessary to perform all operations for the application of a penetrating polymerized asphalt rejuvenating emulsion to asphaltic concrete surface courses. In addition and with the same penetrating carrier liquid apply photocatalytic titanium dioxide to create a pollution reducing pavement surface

The rejuvenation of surface courses shall be by spray application of a polymerized maltene based cationic rejuvenator / pollution- remediating emulsion composed of petroleum oils and resins emulsified with water and containing photocatalytic titanium dioxide Nanoparticles in a minimum parts per million at a specified depth as hereafter required. All work shall be in accordance with the specifications, the applicable drawings, and subject to the terms and conditions of this contract.

335-2 Materials.

Asphalt Rejuvenator:

The asphalt rejuvenating / pollution- remediating emulsion shall be composed of a petroleum resin oil base uniformly emulsified with water. Each bidder must submit a bid with a certified statement from the asphalt rejuvenator manufacturer showing that the asphalt rejuvenating emulsion conforms to the required physical and chemical requirements.

	Test Methods		Requirements	
	ASTM	AASHTO	Min	Max
Tests on Emulsion				
Viscosity @ 25°C, SFS	D-244	T-59	15	40
Residue, % W ¹	D-244(Mod.)	T-59(Mod)	60	65
Miscibility Test ²	D-244(Mod.)	T-59(Mod)	No Coagulation	
Sieve Test, %W ³	D-244(Mod.)	T-59(Mod)		0.1
Particle Charge Test	D-244	T-59	Positive	
Percent Light Transmittance ⁴				30
Tests on Residue from Distillation:				
Flash Point, COC, °C	D-92	T-48	196	
Viscosity @ 60°C, cSt	D-445	-	100	200
Asphaltenes, %w	D-2006-70	-		1.00
Maltene Dist. Ratio ⁵	D-2006-70	-	0.3	0.6
PC/S Ratio ⁵	D-2006-70	-	0.5	
Saturated Hydrocarbons,S ⁵	D-2006-70	-	21	28

1. ASTM D-244 Modified Evaporation Test for percent of residue is made by heating 50 gram sample to 149°C (300°F) until foaming ceases, then cool immediately and calculate results.

2. Test procedure identical with ASTM D-244-60 except that .02 Normal Calcium Chloride solution shall be used in place of distilled water.

3. Test procedure identical with ASTM D-244 except that distilled water shall be used in place of two percent sodium oleate solution.

4. Procedure for Determining Percent Light Transmittance on Asphalt Rejuvenating Agent:

a. Scope: This procedure covers the determination of percent light transmittance of the asphalt rejuvenating agent.

b. Apparatus:

1. Container may be glass, plastic or metal having a capacity of 6,000 ml.
2. Graduated cylinder, 1,000 ml, or greater
3. Light transmittance measuring apparatus, such as Bausch and Lomb or Lumberton spectrophotometer
4. Graduated pipette having 1 ml capacity to 0.01 ml accuracy
5. Suction bulb for use with pipette
6. Test tubes compatible with spectrophotometer, 3/4" X 6, Bausch and Lomb, Catalog No. 33-17- 81, (B&L)

c. Calibration of spectrophotometer:

1. Calibrate spectrophotometer as follows:
 - a. Set wavelength at 580 mu,
 - b. Allow spectrophotometer to warm-up thirty minutes,
 - c. Zero percent light transmittance (%LT) scale,
 - d. Rinse test tube three times with tap water and fill to top of circle marking on B&L test tube or approximately 2/3 full,
 - e. Place tube in spectrophotometer and set %LT scale at 100, and,
 - f. repeat steps (c) and (e) two times or until no further adjustments are necessary.

d. Procedure:

1. Shake, stir or otherwise thoroughly mix emulsion to be tested. Place sample of emulsion in beaker and allow to stand one minute.
2. Place 2,000 ml tap water in container.
3. Suck 1.00 ml emulsion into pipette using suction bulb. Wipe off outside of pipette.
4. Using suction bulb, blow emulsion into container.
5. Rinse pipette by sucking in diluted emulsion solution and blowing out.
6. Clean pipette with soap or solvent and water. Rinse with acetone.
7. Stir diluted emulsion thoroughly.
8. Rinse out tube to be used with the diluted emulsion three times and fill to top of circle.
9. Calibrate spectrophotometer.
10. Place diluted emulsion sample tube in spectrophotometer, cover and read %LT to nearest tenth.

11. Repeat steps 9 and 10 until three identical consecutive readings are achieved.

12. The elapsed time between addition of emulsion to dilution of water and final %LT reading should not exceed 5 minutes.

5. Chemical Composition by ASTM Method D-2006-70:

$$\frac{PC + A_1}{S + A_2}$$

PC = Polar Compounds, A₁ = First Acidaffins
A₂ = Second Acidaffins, S = Saturated Hydrocarbons

The rejuvenating emulsion shall have a record of satisfactory service as an asphalt rejuvenating emulsion and in depth sealer. Satisfactory service shall be based on the capability of the material to decrease the viscosity of the asphalt binder, create a positive increase in the maltene distribution ratio and provide an in-depth seal.

The bidder must submit with his bid the manufacturer's certification that the material proposed for use is in compliance with the specification requirements. The bidder must submit with his bid previous use documentation and test data conclusively demonstrating that; the rejuvenating emulsion has been used successfully and that the asphalt rejuvenating emulsion has been proven to perform, as heretofore required, through field testing as to the required change in asphalt binder rheology.

Photocatalytic Titanium Dioxide:

Additionally, the emulsified carrier liquid shall contain catalytic titanium dioxide Nanoparticles in an amount that will impregnate the asphalt pavement to a depth of four millimeters with an average of 2300 parts per million catalytic anatase titanium dioxide Nano-particles.

The titanium dioxide shall be of the anatase type that has been shown to photocatalyze the oxidation of atmospheric pollutants such as oxides of nitrogen (NOx) and volatile organic compounds (VOCs). The Nanoparticles shall be n-type semiconductors in the particle size range of 5 to 50 nm.

335-3 Material Performance:

The asphalt rejuvenating emulsion shall have the capability to penetrate the asphalt pavement surface. The asphalt rejuvenating emulsion shall be absorbed and incorporated into the asphalt binder. Verification that said incorporation of the asphalt rejuvenating emulsion into the asphalt binder has been effected shall be by analysis of the chemical properties of the asphalt binder rheology.

The viscosity shall be reduced by a minimum of 20% for a pavement two years or less in age or pavements being retreated, and reduced by a minimum of 30% for a pavement greater than two years in age as determined by dynamic shear rheometer (DSR) method for asphalt testing in accord with AASHTO T315-05. This analysis shall apply to extracted asphalt binder, taken from cores extracted fifteen to thirty days following application, in the upper 3/8 inch of pavement. Said viscosity reduction shall be the average of a random sampling of the total treated area. In addition, the treated areas shall be sealed in-depth to the intrusion of air and water.

The Engineer will require that untreated and treated core samples, a minimum of four inches in diameter, be removed by the Contractor at locations indicated by the Engineer. The treated core sample shall be taken in the same lane in close proximity to each untreated sample. A minimum of one untreated and treated core sample shall be taken for each pavement type group or one per 50,000 square yards of treated pavement in each pavement type group.

335-4 Equipment:

335-4.1 Distributor: The distributor for spreading the emulsion shall be self-propelled, and shall have pneumatic tires. The distributor shall be designed and equipped to distribute the asphalt rejuvenating agent uniformly on variable widths of surface at readily determined and controlled rates from 0.04 to 0.08 gallons per square yard of surface, and with an allowable variation from any specified rate not to exceed 5% of the specified rate.

Distributor equipment shall include full circulation spray bars, pump tachometer, volume measuring device and a hand hose attachment suitable for application of the emulsion manually to cover areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the emulsion within the tank.

The rate of application shall be controlled by an onboard computer control system designed to uniformly and consistently control the selected application rate in gallons per square yard regardless of the forward speed of the distributor truck.

A check of distributor equipment as well as application rate accuracy and uniformity of distribution shall be made when directed by the Engineer.

335-4.2 Aggregate Cover Truck: The truck used for cover aggregate application shall be equipped with a spreader that allows the aggregate to be uniformly distributed onto the pavement. The spreader shall be able to apply 1/2 pound to 3 pounds of aggregate per square yard in a single pass. The spreader shall be adjustable so as not to broadcast aggregate onto driveways or to lawns.

The aggregate to be used shall be free flowing rock dust, without any leaves, dirt, stones, etc. Any wet material shall be rejected from the job site.

Any equipment that is not maintained in full working order, or is proven inadequate to obtain the results prescribed, shall be repaired or replaced at the direction of the Engineer.

335-4.3 Calibration:

Distributor- Prior to construction and when required by the Engineer, calibrate the distributor in accordance with ASTM D2995-99 in the presence of the Engineer. The distributor shall be moving forward at the proper application speed at the time the spray bar is opened. If at any time a nozzle becomes clogged or not spraying a proper pattern, the operation shall be immediately halted until repairs are made.

Aggregate Spreader- Prior to construction and when required by the Engineer, calibrate the spreader in accordance with ASTM D5624-02, in the presence of the Engineer. The allowable deviation in the amount of aggregate spread on each of the rubber mats shall not exceed plus or minus 1 pound per square yard in the transverse direction, or plus or minus 1 pound per square yard in the longitudinal direction, from the design application rate.

335-5 Construction:

335-5.1 Layout: The Contractor will be responsible for the lay out of the roadway and project planning and sequencing to meet traffic control requirements prior to paving.

335-5.2 Weather and Seasonal limitations: The asphalt-rejuvenating / pollution remediating emulsion shall not be applied to a wet surface or when rain is occurring or the threat of rain is present immediately before placement. The surface treatment shall not be applied when the temperature is less than 40° in the shade. When applying emulsions, the temperature of the surface shall be a minimum of 45°F, and no more than 150°F.

If unexpected rain occurs prior to material penetration, the agent shall be reapplied at no cost to the Agency. Further, the contractor's traffic control and project monitoring shall continue until the application has penetrated, area has had the aggregate applied and the surface is safe for vehicular travel.

335-5.3 Preparation of Surface: The contractor will be responsible for blowing or sweeping the road immediately ahead of the application operation to make sure the road is free of standing water, dirt, loose aggregate and other debris. The surface shall be clean and dry prior to the application.

335-5.4 Application of Asphalt Rejuvenating / Pollution Remediating Emulsion: The asphalt-rejuvenating / pollution remediating emulsion shall be applied by a distributor truck at the temperature recommended by the manufacturer and at the pressure required for the proper distribution. The emulsion shall be so applied that uniform distribution is obtained at all points of the areas to be treated. Distribution shall be commenced with a running start to insure full rate of spread over the entire area to be treated. Areas inadvertently missed shall receive additional treatment as may be required by hand sprayer application.

335-5.4.1 Material Placement: Application of asphalt rejuvenating / pollution remediating emulsion agent shall be on one-half width of the pavement at a time. When the second half of the surface is treated, the distributor nozzle nearest the center of the road shall overlap the previous application by at least one-half the width of the nozzle spray. In any event the centerline construction joint of the pavement shall be treated in both application passes of the distributor truck.

Before spreading, the asphalt rejuvenating / pollution remediating emulsion shall be blended with water at the rate of two parts emulsion to one part water, by volume or as recommended by the manufacturer. The combined mixture of asphalt rejuvenating / pollution remediating emulsion and water shall be spread at the rate of 0.04 to 0.08 gallons per square yard, or as approved by the Engineer following field testing.

Where more than one application is to be made, succeeding applications shall be made as soon as penetration of the preceding application has been completed and the Engineer grants approval for additional applications. Grades or super elevations of surfaces that may cause excessive emulsion runoff, in the opinion of the Engineer, shall have the required amounts applied in two or more applications as directed. After the street has been treated, the area within one foot of the curb line on both sides of the road, when directed shall receive an additional uniformly applied treatment of the asphalt rejuvenating / pollution remediating emulsion as directed by the engineer.

The Contractor shall furnish a quality inspection report showing the source, manufacturer, and the date shipped, for each load of asphalt rejuvenating / pollution remediating emulsion. When directed by the Engineer, the Contractor shall take representative samples of the emulsion for testing.

335-5.4.2 Test Strip for Application Rate: Prior to start of the project, the contractor shall perform test strip applications as directed by the engineer. Test strips shall be performed for each pavement group of similar age and type within the project area.

The test strips shall be applied at a minimum width of 6 feet and for a length of 50 feet. A total of three test strips shall be applied at application rates of 0.04, 0.08 and 0.10 gallons per square yard, respectively. The time, in minutes, for essentially complete absorption of the asphalt rejuvenating / pollution remediating emulsion shall be recorded for each test strip. The optimal rate to be used in a given area shall be that rate essentially absorbed within 20 minutes.

In the event that all three of the standard test rates are absorbed completely within the 20 minute timeframe, then the Contractor and the Engineer shall agree on a fourth test strip application rate.

Upon completion of the test strips for each pavement group, the Engineer will determine the final application rate to be applied to each pavement group.

335-5.4.3 Aggregate Application: After the asphalt rejuvenating /pollution remediating emulsion has penetrated, and when recommended by the Contractor and approved by the Engineer, a coating of dry rock dust aggregate shall be applied to the surface in sufficient amount to protect the traveling public as required.

All aggregate used during the treatment must be removed no later than 24 hours after treatment of a roadway. This shall be accomplished by a combination of hand and mechanical sweeping. All turnouts, cul-de-sacs, etc. must be cleaned of any material to the satisfaction of the Engineer. Street sweeping will be included in the price bid per square yard for asphalt rejuvenating /pollution remediating emulsion.

If, after the aggregate is swept and in the opinion of the Engineer a hazardous condition exists on the roadway, the contractor must apply additional aggregate and sweep same no later than 24 hours following reapplication. No additional compensation will be allowed for reapplication and removal of materials.

335-5.4.4 Handling of Asphalt Rejuvenating / Pollution Remediating Emulsion: Contents in tank cars or storage tanks shall be circulated at least 45 minutes before withdrawing any material for application. When loading the distributor, the asphalt rejuvenating / pollution remediating emulsion concentrate shall be loaded first and then the required amount of water shall be added. The water shall be added into the distributor with enough force to cause agitation and thorough mixing of the two materials. To prevent foaming, the discharge end of the water hose or pipe shall be kept below the surface of the material in the distributor that shall be used as a spreader. The distributor truck will be cleaned of all of its asphalt materials, and washed out to the extent that no discoloration of the emulsion may be perceptible. Cleanliness of the spreading equipment shall be subject to the approval and satisfaction of the Engineer.

335-5.4.5 Street Sweeping: The Contractor shall be responsible for sweeping and cleaning of the streets after treatment. All aggregate used during the treatment must be removed no later than 48 hours after treatment of the street. This shall be accomplished by a combination of hand and mechanical sweeping. All turnouts, cul-de-sacs, etc. must be cleaned of any material to the satisfaction of the Engineer.

If, after aggregate is swept and in the opinion of the Engineer a hazardous condition exists on the roadway, the contractor must apply additional aggregate and sweep same no later than 24 hours following reapplication. No additional compensation will be allowed for reapplication and removal of aggregate.

335-5.4.6 Resident Notification: The contractor shall distribute by hand, a typed notice to all residences and businesses on the street to be treated. The notice will be delivered no more than 24 hours prior to the treatment of the road. The notice will have a local phone number

that residents may call to ask questions. The notice shall be of the door hanger type, which secures to the door handle of each dwelling. Unsecured notices will not be allowed. The contractor shall also place the notice on the windshield of any parked cars on the street. Hand distribution of this notice will be considered incidental to the contract.

335-5.6 Traffic Control.

The Contractor shall furnish all necessary traffic control, barricades, signs and flagmen, to ensure the safety of the traveling public and to all working personnel. Traffic shall not travel on fresh Asphalt Rejuvenator / Pollution Remediating Emulsion until penetration, in the opinion of the Engineer, has become complete and the area is suitable for traffic. The Contractor shall submit an M.O.T plan indicating all facets of traffic control for the project area. The MOT plan must be approved in writing by the Engineer prior to commencing any work. All traffic control shall be in accordance with applicable Roadway Design Standards, most current edition. Associated devices shall be checked daily and periodically throughout the project for compliance; and where adjustments or corrections are needed, prompt revisions shall be made.

335-5.7 Method of Measurement.

Asphalt rejuvenating / pollution remediating emulsion shall be paid at the Contract bid unit price and for the actual square yards of pavement treated as field measured. Said payment shall be and is compensation in full for all costs of furnishing and applying the material as specified, including cleaning the existing pavement, stationing, purchase of aggregate, delivery of aggregate, all labor, equipment, and materials necessary for the placement of the asphalt rejuvenating / pollution remediating emulsion, sweeping of any loose material after construction and other requirements as specified. Traffic control for maintaining traffic for constructing asphalt rejuvenating / pollution remediating emulsion shall be considered incidental to the work unless specified elsewhere in the plans or proposal.

Payment for removal of untreated and treated cores shall be paid for as each at the unit price bid for Test Core Removal.

Payment for laboratory analysis of untreated and/or treated test cores shall be paid for as each at the unit price bid for Test Core Laboratory Analysis.

335-8 Basis of Payment.

Payment will be made under:

Asphalt Rejuvenating / Pollution Remediating Emulsion	Square Yard
Test Core Removal	Each
Test Core Laboratory Analysis- Viscosity	Each