VILLAGE OF DOWNERS GROVE
Report for the Village
8/6/2019

SUBJECT:	SUBMITTED BY:
Bid - 2019 Street Preservative Seal	Nan Newlon Director of Public Works

SYNOPSIS

A motion is requested to award a contract for the 2019 Preservative and Restorative Seal (CIP Project ST-004E) to Corrective Asphalt Materials, LLC South Roxana, Illinois in the amount of $172,047.68.

STRATEGIC PLAN ALIGNMENT

The goals for 2017-2019 include *Top Quality Infrastructure*.

FISCAL IMPACT

The FY19 Budget includes $200,000 in the Capital Fund for this project.

RECOMMENDATION

Approval on the August 6, 2019 Consent Agenda.

BACKGROUND

This contract is a component of the 2019 Roadway Maintenance Program (CIP Project ST-004). The scope of this contract includes application of a rejuvenating/sealing agent on approximately 193,000 square yards of Village streets. The purpose of this product is to extend the life of the asphalt and increase the time between more expensive maintenance activities.

A Call for Bids (CFB) was issued and published in accordance with the Village's Purchasing Policy. Two bids were received on July 2nd. A synopsis of the bids is as follows:

Contractor	Base Bid	
Corrective Asphalt Materials, LLC	**$172,047.68**	**Low Bid**
Austin Tyler Construction, Inc.	**$212,643.20**	

Corrective Asphalt Materials has satisfactorily performed work of similar scope for the Village in 2016, 2017, and 2018, as well as multiple projects for the City of Elmhurst, Lisle Township and the Villages of Lombard, Villa Park and Glen Ellyn. Staff recommends award of this contract to Corrective Asphalt Materials, LLC.

ATTACHMENTS

Contract Documents
List of Streets
Map
Contractor Evaluation Form

CALL FOR BIDS – FIXED WORKS PROJECT

I. Name of Company Bidding: Corrective Asphalt Materials, LLC

II. Instructions and Specifications:
- A. Bid No.: ST-004E
- B. For: Preservative and Restorative Seal for Asphalt Pavements
- C. Bid Opening Date/Time: TUESDAY, JULY 2, 2019 @ 10:00AM
- D. Pre-Bid Conference Date/Time: NONE
- E. Pre-Bid Conference Location: NONE
- F. CONTRACT DOCUMENTS FOR PICKUP AT THE PUBLIC WORKS BUILDING, 5101 WALNUT AVE, DOWNERS GROVE, IL 60515

III. Required of All Bidders:
- A. Bid Deposit: 5%
- B. Letter of Capability of Acquiring Performance Bond: YES

IV. Required of Awarded Contractor(s)
- A. Performance Bond or Letter of Credit: YES
- B. Certificate of Insurance: YES

Legal Advertisement Published: TUESDAY, JUNE 18, 2019

This document comprises 47 pages, 1 map and 1 street list

RETURN ORIGINAL BID IN SEALED ENVELOPE MARKED WITH THE BID NUMBER AS NOTED ABOVE TO:

STEPHANIE GRAVES
STAFF ENGINEER II
VILLAGE OF DOWNERS GROVE
5101 WALNUT AVENUE
DOWNERS GROVE, IL 60515
PHONE: 630/434-5487
FAX: 630/434-5495
www.downers.us

CALL FOR BIDS – FIXED WORKS PROJECT

Bid No.: ST-004E

The VILLAGE OF DOWNERS GROVE will receive bids Monday thru Friday, 8:00 A.M. to 5:00 P.M. at the Public Works Building, 5101 Walnut Avenue, Downers Grove, IL 60515.

The Village Council reserves the right to accept or reject any and all bids, to waive technicalities and to accept or reject any item of any Bid.

The documents constituting component parts of this Contract are the following:

I. CALL FOR BIDS

II. TERMS & CONDITIONS

III. GENERAL PROVISIONS

IV. SPECIAL PROVISIONS

V. BID & CONTRACT FORM

All Bidders MUST submit the entire bid package, with one original Bid Form. Upon formal Award, the successful Bid will automatically convert to a Contract, and the successful Bidder will receive a copy of the executed contract upon formal award of the Bid with the Notice of Award.

DO NOT DETACH ANY PORTION OF THIS DOCUMENT. INVALIDATION COULD RESULT.

I. CALL FOR BIDS and INSTRUCTIONS TO BIDDERS

1. GENERAL

1.1 Notice is hereby given that Village of Downers Grove will receive sealed bids up to TUESDAY, JULY 2, 2019 @ 10:00AM

1.2 Defined Terms:

1.2.1 Village – the Village of Downers Grove acting through its officers or agents.

1.2.2 Contract Documents – this document plus any drawings issued therewith, any addenda and the Bidder's completed proposal, bonds and all required certifications.

1.2.3 Bid – this document completed by an individual or entity and submitted to the Village.

1.2.4 Bidder – the individual or entity who submits or intends to submit a bid proposal to the Village.

1.2.5 Contractor – the individual or entity whose bid is selected by the Village and who enters into a contract with the Village.

1.2.6 Work – the construction or service defined herein.

1.2.7 Day – unless otherwise stated all references to day "Day" "Days", "day" or "days" shall refer to calendar days.

1.2.8 Proposal Guaranty – the required bid deposit.

1.3 Bids must be received at the Village by the time and date specified. Bids received after the specified time and date will not be accepted and will be returned unopened to the Bidder.

1.4 Bids shall be sent to the Village of Downers Grove, ATTN: STEPHANIE GRAVES, in a sealed envelope marked "SEALED BID". The envelope shall be marked with the name of the project, date, and time set for receipt of Bids. The bid package may be submitted any time prior to the time set for receipt of Bids.

1.5 All Bids must be submitted on the forms supplied by the Village and signed by a proper official of the company submitting the Bid. Telephone, email and fax Bids will not be accepted.

1.6 Under penalty of perjury, the Bidder certifies by submitting this Bid that he has not acted in collusion with any other Bidder or potential Bidder.

2. BID PREPARATION

2.1 It is the responsibility of the Bidder to carefully examine the Contract Documents and to be familiar with all of the requirements, stipulations, provisions, and conditions surrounding the proposed Work.

2.2 The Bidder shall inspect the site of the proposed Work in detail, investigate and become familiar with all the local conditions affecting the Work and become fully acquainted with the detailed requirements of the Work. Submitting a Bid shall be a conclusive assurance and warranty that the Bidder has made these examinations and that the Bidder understands all requirements for the performance of the Work. If the Bid is accepted, the Bidder will be responsible for all errors in the Bid resulting from his willing or neglectful failure to comply with these instructions. IN NO CASE WILL THE VILLAGE BE RESPONSIBLE FOR ANY COSTS, EXPENSES, LOSSES OR CHANGES IN ANTICIPATED MARGINS OF PROFIT RESULTING FROM THE WILLING OR NEGLECTFUL FAILURE OF THE BIDDER TO MAKE THESE EXAMINATIONS. THE VILLAGE WILL NOT BE RESPONSIBLE FOR ANY COSTS, EXPENSES, LOSSES OR CHANGES IN ANTICIPATED MARGINS OF PROFIT RESULTING FROM THE WILLING OR NEGLECTFUL FAILURE OF THE CONTRACTOR TO PROVIDE THE KNOWLEDGE, EXPERIENCE AND ABILITY TO PERFORM THE WORK REQUIRED BY THIS CONTRACT. No changes in the prices, quantities or contract provisions shall be made to accommodate the inadequacies of the Bidder, which might be discovered subsequent to award of contract. The Bidder shall take no advantage of any error or omission in the Contract Documents nor shall any error or omission in the Contract Documents serve as the basis for an adjustment of the amounts paid to the Bidder.

2.3 When the Contract Documents include information pertaining to subsurface explorations, borings, test pits, and other preliminary investigations, such information is included solely for the convenience of the Bidder. *The Village assumes no responsibility whatsoever with respect to the sufficiency of the information, and does not warrant, neither expressly nor by implication, that the conditions indicated represent those existing throughout the Work, or that unanticipated developments may not occur.*

2.4 Any information shown in the Contract Documents regarding the locations of underground utility facilities is included solely for the convenience of the Bidder. The Village assumes no responsibility whatsoever with respect to the sufficiency, accuracy or inadequacy of such information. It shall be the Bidder's responsibility to obtain detailed information from the respective utility companies relating to the location of their facilities and the work schedules of the utility companies for removing or adjusting them. Utilities whose facilities may be affected by the work include, but may not be limited to, the following: Nicor, ComEd, SBC, Comcast Cable, Downers Grove Sanitary District, and Village water, storm sewer, and street lighting systems.

2.5 No oral or telephone interpretations of specifications shall be binding upon the Village. All requests for interpretations or clarifications shall be made in writing and received by the Village at least five (5) business days prior to the date set for receipt of Bids or the pre-bid conference, if offered. The Village shall make all changes or interpretations of the Contract Documents in a written addendum and shall provide an addendum to any Bidder of record. Any and all changes to the Contract Documents are valid only if they are included by written addendum to all Bidders. Each Bidder must acknowledge receipt of any addenda by indicating same on the Bid Form. Each Bidder, by acknowledging receipt of any addenda, is responsible for the contents of the addenda and any changes to the Bid therein. Failure to acknowledge any addenda may cause the Bid to be rejected. The Village will not assume responsibility for receipt of any addenda. In all cases, it will be the Bidder's responsibility to obtain all addenda issued. Bidders will provide written acknowledgement of receipt of each addendum issued with the bid submission.

2.6 An estimate of the quantities of Work to be performed and the materials to be furnished is shown in

the Bid Form. It is given as a basis for comparing the properly submitted Bids, and shall be used by the Village in awarding the Contract. The Village does not expressly warrant nor imply that the estimated quantities shown will correspond with those quantities required to perform the Work. No Bidder shall plead misunderstanding or deception because of such an estimate of quantities, or because of the character, location or other conditions pertaining to the Work. Payment shall be based on the actual quantities of work properly performed in accordance with the Contract, at the Contract unit prices specified. The Village reserves the right to increase, decrease or omit entirely, any or all items. No allowance will be made for any change in anticipated profits due to an increase or decrease in the original estimate of quantities.

2.7 The Bid shall be executed properly, and Bids shall be made for all items indicated in the Bid Form. The Bidder shall indicate, in figures, a unit price or lump sum price for each of the separate items called for in the Bid Form. The Bidder shall show the products of the respective quantities and unit prices in the column provided for that purpose. The gross sum shown in the place indicated in the Bid Form shall be the summation of said products. All writing shall be with ink or typewriter, except the signature of the Bidder, which shall be written with ink.

2.8 In case of error in the extension of prices in the Bid, the hourly rate or unit price will govern. In case of discrepancy in the price between the written and numerical amounts, the written amount will govern.

2.9 All costs incurred in the preparation, submission, and/or presentation of any Bid including the Bidder's travel or personal expenses shall be the sole responsibility of the Bidder and will not be reimbursed by the Village.

2.10 The Bidder hereby affirms and states that the prices quoted herein constitute the total cost to the Village for all work involved in the respective items, as well as the materials to be furnished in accordance with the collective requirements of the Contract Documents. The Bidder also affirms that this cost includes all insurance, bonds, royalties, transportation charges, use of all tools and equipment, superintendence, overhead expense, profits and other work, services and conditions necessarily involved in the work to be done.

2.11 The Bidder shall complete and submit with the Bid an "Affidavit" (IDOT Form BC-57, or similar)listing all uncompleted contracts, including subcontract work; all pending low bids not yet awarded or rejected, and equipment available.

2.12 The Bidder shall complete and submit with the Bid a "Municipal Reference List" indicating other municipalities for which the Bidder has successfully performed similar work.

3. PRE-BID CONFERENCE

3.1 A pre-bid conference may be offered to provide additional information, inspection or review of current facilities or equipment, and to provide an open forum for questions from Bidders. This pre-bid conference is not mandatory (unless stated "Mandatory" on the cover of this document), but attendance by Bidders is strongly advised as this will be the last opportunity to ask questions concerning the Bid.

3.2 Questions may be posed in writing to the Village (faxed and emailed questions are acceptable), but

must be received by the Village prior to the scheduled time for the pre-bid conference. Questions received will be considered at the conference. An addendum may be issued as a result of the pre-bid conference. Such an addendum is subject to the provisions for issuance of an addendum as set forth in Section 2.5 above.

3.3 No Contract Documents will be issued after a mandatory pre-bid conference except to attendees.

4. BID SUBMISSION

4.1 An original copy of the sealed bid marked as indicated in Section 1 shall be submitted to the Village.

4.2 A bid deposit will be required, which shall not exceed ten percent (10%) of the estimated cost of the work to be furnished. Such bid deposit shall be in the form of a bid bond, certified check, cash or money order. Checks shall be drawn upon a bank of good standing payable to the order of the Village and said deposit shall be forfeited to the Village in the event the Bidder neglects or refuses to enter into a contract and bond when required, with approved sureties, to execute the Work or furnish the material for the price mentioned in his Bid and according to the plans and specifications in case the contract shall be awarded to him.

4.3 Bids shall be publicly opened at the hour and place indicated above.

5. BID MODIFICATION OR WITHDRAWAL

5.1 A Bid that is in the possession of the Village may be altered by a letter bearing the signature of the person authorized for submitting a Bid, provided that it is received prior to the time and date set for the bid opening. Telephone, email or verbal alterations of a Bid will not be accepted.

5.2 A Bid that is in the possession of the Village may be withdrawn by the Bidder, up to the time set for the bid opening, by a letter bearing the signature of the person authorized for submitting Bids. Bids may not be withdrawn after the bid opening and shall remain valid for a period of ninety (90) days from the date set for the bid opening, unless otherwise specified.

6. BID REJECTION

6.1 Bids that contain omissions, erasures, alterations, additions not called for, conditional bids or alternate bids not called for, or irregularities of any kind, shall be rejected as informal or insufficient. Bids otherwise acceptable, which are not accompanied by the proper Proposal Guaranty, shall also be rejected as informal or insufficient. The Village reserves the right however, to reject any or all Bids and to waive such technical error as may be deemed best for the interest of the Village.

7. BIDDER COMPETENCY

7.1 No Bid will be accepted from, or contract awarded to, any person, firm or corporation that is in arrears or is in default upon any debt or contract. The Bidder, if requested, must present evidence to the Village of ability and possession of necessary facilities, and financial resources to comply with the terms of the Contract Documents. Evidence must be presented within three (3) business days.

8. BIDDER DISQUALIFICATION

8.1 Any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid.

8.1.1 More than one Bid for the same Work from an individual, firm partnership, or corporation under the same or different names.

8.1.2 Evidence of collusion among Bidders.

8.1.3 Unbalanced Bids in which the prices for some items are substantially out of proportion to the prices for other items.

8.1.4 Failure to submit a unit price for each item of Work listed in the Bid Form.

8.1.5 Lack of competency as revealed by financial statement or experience questionnaire.

8.1.6 Unsatisfactory performance record as shown by past work, judged from the standpoint of workmanship and progress.

8.1.7 Uncompleted work which, in the judgment of the Village, might hinder or prevent the prompt completion of this Work.

8.1.8 Failure to submit a signed Bidder's Certificate stating the following:

8.1.8.1 That the Bidder is not barred from bidding on this Contract as a result of a violation of Sections 720 ILCS 5/33-E3 and 720 ILCS 5/33-E4 of the Illinois Compiled Statutes; and

8.1.8.2 The Bidder is not delinquent in the payment of any tax administered by the Illinois Department of Revenue; and

8.1.8.3 The Bidder will maintain the types and levels of insurance required by the terms of this Contract; and

8.1.8.4 The Bidder will comply with the Illinois Prevailing Wage Act, 820 ILCS 130/1 *et seq.*

9. BASIS OF AWARD

9.1 The Village reserves the exclusive right to accept or reject any and all Bids or to waive sections, technicalities and irregularities, or to accept or reject any Bid or any item of any Bid.

10. AWARD OF CONTRACT

10.1 Unless the Village exercises its right to reject all Bids, the Contract will be awarded to that responsible Bidder whose Bid, conforming to the Contract Documents, will be most advantageous to the Village, price and other factors considered. (The credentials, financial information, bonding capacity, insurance protection, qualifications of the labor and management of the firm, past experience and ability to complete the project within time frame required - lowest responsible bidder)

10.2 Unless otherwise specified, if a Contract is not awarded within ninety (90) days after the opening of Bids, a Bidder may file a written request with the Village for the withdrawal of their Bid. The Village will have a maximum of ten (10) days after the receipt of such request to award the Contract or release

the Bidder from further obligation by return of the Bidder's bid deposit. Any attempt or actual withdrawal or cancellation of a Bid by the awarded contractor who has been notified by the Village of the acceptance of said Bid shall be considered a breach of contract.

11. RETURN OF BID DEPOSIT

11.1 The bid deposit of all except the three (3) lowest responsive bidders on each contract will be returned within fifteen (15) days after the opening of Bids. The remaining bid deposits of each contractor will be returned within fifteen (15) days after the Village Council has awarded the contract and the required appurtenances to the contract have been received.

12. FAILURE TO ENTER INTO CONTRACT

12.1 Failure on the part of the successful Bidder to execute a Contract and provide acceptable bonds, as provided herein, within ten (10) days from the date of receipt of the Contract and Notice of Award from the Village, will be considered as just cause for the revocation of the award. The Bidder's bid security shall then be forfeited to the Village, not as a penalty, but in payment of liquidated damages sustained as a result of such failure.

12.2 The Bidder shall not be allowed to claim lack of receipt where the Contract and Notice of Award was mailed by U.S. Postal Services certified mail to the business address listed in his Bid. In case the Village does not receive evidence of receipt within ten (10) days of the date of Notice of Award, the Village may revoke the award. The Bidder shall then forfeit the bid security to the Village, not as a penalty, but in payment of liquidated damages sustained as the result of such failure to execute the Contract.

12.3 By submitting a Bid, the Bidder understands and agrees that, if his Bid is accepted, and he fails to enter into a contract forthwith, he shall be liable to the Village for any damages the Village may thereby suffer.

13. SECURITY FOR PERFORMANCE

13.1 The successful Bidder shall, within ten (10) days after acceptance of the Bidder's Bid by the Village, furnish a Performance Bond and a Materials and Labor Payment Bond acceptable to the Village in the full amount of the Bid. Said bonds shall guarantee the Bidder's performance under the Contract Documents and shall guarantee payment of all subcontractors and material suppliers. Any bond shall include a provision that guarantees faithful performance of the Illinois Prevailing Wage Act, 820 ILCS 130/1 et seq.

14. TAX EXEMPTION

14.1 The Village is exempt from Illinois sales or use tax for direct purchases of materials and supplies. A copy of the Illinois Sales Tax Exemption Form will be issued upon request. The Village's federal identification number will also be provided to the selected Bidder.

15. RESERVED RIGHTS

15.1 The Village reserves the right to waive sections, irregularities, technicalities and informalities to this Contract and to accept any Bid and to reject any and all Bids and to disapprove of any and all subcontractors as may be in the best interest of the Village. Time and date requirements for receipt of Bids, however, will not be waived.

16. CATALOGS AND SHOP DRAWINGS

16.1 Each Bidder shall submit catalogs, descriptive literature, and detailed drawings, where applicable, to fully illustrate and describe the work or material he proposes to furnish.

17. TRADE NAMES AND SUBSTITUTIONS

17.1 Certain materials and equipment are specified by a manufacturer or trade name to establish standards or quality and performance and not for the purpose of limiting competition. Products of other manufacturers may be substituted, if, in the opinion of the Village, they are equal to those specified in quality, performance, design, and suitability for intended use. If the Bidder proposes to furnish an "equal", the proposed "equal" item must be so indicated in the written Bid. Where two or more items are specified, the selection among those specified is the Bidder's option, or he may submit his Bid on all such items. Detail specification sheets shall be provided by Bidder for all substituted items.

II. TERMS AND CONDITIONS

18. VILLAGE ORDINANCES

18.1 The successful Bidder, now the Contractor, will strictly comply with all ordinances of the Village of Downers Grove and laws of the State of Illinois.

19. USE OF VILLAGE'S NAME

19.1 The Contractor is specifically denied the right of using in any form or medium the name of the Village for public advertising unless the Village grants express permission.

20. HOURS OF WORK

20.1 The Contractor shall do no work between the hours of 7:00 p.m. and 7:00 a.m., nor on Saturdays, Sundays or legal holidays, unless otherwise approved in writing by the Village. However, such work may be performed at any time if necessary, for the proper care and protection of work already performed, or in case of an emergency. All after-hour work is still subject to the permission of the Village. Any work, including the starting and/or idling of vehicles or machinery, or a congregation of workers prior to starting work, which may cause any noise level that can be heard by adjacent residents, performed outside of these hours of work and not authorized by the Village shall be subject to a fine of $250 per day, per violation.

21. PERMITS AND LICENSES

21.1 The Contractor shall obtain all necessary permits and licenses required to complete the Work. The cost of acquisition of all necessary permits, bonds, insurance and services as specified herein shall be considered INCLUDED IN THE TOTAL COST, and no additional compensation will be allowed the Contractor.

22. INSPECTION

22.1 The Village shall have a right to inspect, by its authorized representative, any material, components or workmanship as herein specified. Materials, components or workmanship that have been rejected by the Village as not in accordance with the terms of the contract specifications shall be replaced by the Contractor at no cost to the Village.

23. DELIVERIES

23.1 All materials shipped to the Village must be shipped F.O.B. designated location, Downers Grove, Illinois.

24. SPECIAL HANDLING

24.1 Prior to delivery of any product that is caustic, corrosive, flammable or dangerous to handle, the Contractor will provide written directions as to methods of handling such products, as well as the antidote or neutralizing material required for its first aid before delivery. Contractor shall also notify the Village and provide material safety data sheets for all substances used in connection with this Contract which are defined as toxic under the Illinois Toxic Substances Disclosure to Employees Act.

25. NONDISCRIMINATION

25.1 Contractor shall, as a party to a public contract:

25.1.1 Refrain from unlawful discrimination in employment and undertake affirmative action to assure equality of employment opportunity and eliminate the effects of past discrimination;

25.1.2 By submission of this Bid, the Contractor certifies that he is an "equal opportunity employer" as defined by Section 2000(e) of Chapter 21, Title 42, U.S. Code Annotated and Executive Orders #11246 and #11375, which are incorporated herein by reference. The Equal Opportunity clause, Section 6.1 of the Rules and Regulations of the Department of Human Rights of the State of Illinois, is a material part of any contract awarded on the basis of this Bid.

25.2 It is unlawful to discriminate on the basis of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, military status, order of protection status, sexual orientation, sexual identity, or an unfavorable discharge from military service. Contractor shall comply with standards set forth in Title VII of the Civil Rights Act of 1964, 42 U.S.C. Secs. 2000 et seq., The Human Rights Act of the State of Illinois, 775 ILCS 5/1-101 et seq., and The Americans with Disabilities Act, 42 U.S.C. Secs. 12101 et seq.

26. SEXUAL HARASSMENT POLICY

26.1 The Contractor, as a party to a public contract, shall have a written sexual harassment policy that:

26.1.1 Notes the illegality of sexual harassment;

26.1.2 Sets forth the State law definition of sexual harassment;

26.1.3 Describes sexual harassment utilizing examples;

26.1.4 Describes the Contractor's internal complaint process including penalties;

26.1.5 Describes the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Human Rights Commission and how to contact these entities; and

26.1.6 Describes the protection against retaliation afforded under the Illinois Human Rights Act.

27. EQUAL EMPLOYMENT OPPORTUNITY

27.1 In the event of the Contractor's non-compliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be canceled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of this Contract, the Contractor agrees as follows:

27.1.1 That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, military status, order of protection status, sexual orientation,

sexual identity, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

27.1.2 That, if it hires additional employees in order to perform this Contract or any portion thereof, it will determine the availability (in accordance with the Department's Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

27.1.3 That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, military status, order of protection status, sexual orientation, or an unfavorable discharge from military services.

27.1.4 That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the Contractor will promptly so notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

27.1.5 That it will submit reports as required by the Department's Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.

27.1.6 That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purpose of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.

27.1.7 That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as with other provisions of this Contract, the Contractor will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivision or municipal corporations.

28. DRUG FREE WORK PLACE

28.1 Contractor, as a party to a public contract, certifies and agrees that it will provide a drug free workplace by:

28.1.1 Publishing a statement:
(1) Notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the Village's or Contractor's workplace.
(2) Specifying the actions that will be taken against employees for violations of such prohibition.
(3) Notifying the employee that, as a condition of employment on such contract or grant, the employee will:
(A) abide by the terms of the statement; and
(B) notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.

28.1.2 Establishing a drug free awareness program to inform employees about:
(1) the dangers of drug abuse in the workplace;
(2) the Village's or Contractor's policy of maintaining a drug free workplace;
(3) any available drug counseling, rehabilitation and employee assistance programs;
(4) the penalties that may be imposed upon employees for drug violations.

28.1.3 Providing a copy of the statement required by subparagraph 1.1 to each employee engaged in the performance of the contract or grant and to post the statement in a prominent place in the workplace.

28.1.4 Notifying the contracting or granting agency within ten (10) days after receiving notice under part (3)(B) of subparagraph 1.1 above from an employee or otherwise receiving actual notice of such conviction.

28.1.5 Imposing a sanction on, or requiring the satisfactory participation in a drug abuse assistance or rehabilitation program by, any employee who is so convicted as required by section 5 of the Drug Free Workplace Act.

28.1.6 Assisting employees in selecting a course of action in the event drug counseling, treatment and rehabilitation is required and indicating that a trained referral team is in place.

28.1.7 Making a good faith effort to continue to maintain a drug free workplace through implementation of the Drug Free Workplace Act.

29. SUBSTANCE ABUSE PREVENTION ON PUBLIC WORKS PROJECTS ACT

29.1 In the event this is a public works project as defined under the Prevailing Wage Act, 820 ILCS 130/2, Contractor agrees to comply with the Substance Abuse Prevention on Public Works Projects Act , 820 ILCS 265/1 *et seq.*, and further agrees that all of its subcontractors shall comply with such Act.. As required by the Act, Contractor agrees that it will file with the Village prior to commencing work its written substance abuse prevention program and/or that of its subcontractor(s) which meet or exceed the requirements of the Act.

30. PREVAILING WAGE ACT

30.1 Contractor agrees to comply with the Illinois Prevailing Wage Act, 820 ILCS 130/1 *et seq.,* for all work completed under this Contract. Contractor agrees to pay the prevailing wage and require that all of its subcontractors pay prevailing wage to any laborers, workers or mechanics who perform work pursuant to this Contract or related subcontract. For applicable rates, go to the State of Illinois – Department of Labor website (www.state.il.us/agency/idol/rates/rates.HTM) and use the most current DuPage County rate. The Department revises the prevailing wage rates and the Contractor or subcontractor has an obligation to check the Department's website for revisions to prevailing wage rates throughout the duration of this Contract.

30.2 Contractor and each subcontractor shall keep or cause to be kept accurate records of all laborers, mechanics and other workers employed by them on the public works project, which records must include each worker's name, address, telephone number when available, social security number, classification, hourly wage paid (including itemized hourly cash and fringe benefits paid in each pay period), number of hours worked each day, and the starting and ending times of work each day These records shall be open to inspection at all reasonable hours by any representative of the Village or the Illinois Department of Labor and must be preserved for five (5) years from the date of the last payment on the public work.

30.3 Since this is a contract for a public works project, as defined in 820 ILCS 130/2, Contractor agrees to post at the job site in an easily accessible place, the prevailing wages for each craft or type of worker or mechanic needed to execute the contract or work to be performed.

30.4 Because this is a public works project as defined under the Prevailing Wage Act, 820 ILCS 130/2, any and all contractors and subcontractors shall submit certified payroll records to the Village no later than the tenth (10^{th}) day of each calendar month for the immediately preceding month in which construction on a public works project has occurred. WITHOUT THIS PAPERWORK, NO INVOICE SHALL BE PAID BY THE VILLAGE. Contractors and subcontractors must also submit a statement affirming that the records are true and accurate, that the wages paid to each worker are not less than the prevailing rate, and that the contractor and subcontractor are aware that filing false records is a Class A misdemeanor. The records must include the name, address, telephone number, social security number, job classification, hours of work, hourly rate, and start and end time of work each day for every worker employed on the public work. The Village reserves the right to check the pay stubs of the workers on the job. The Village further cautions that payment for any services rendered pursuant to this Contract may be predicated upon receipt of said records.

30.5 In the event that this is a construction project where Motor Fuel tax monies or state grant monies are used in the construction, maintenance and extension of municipal streets, traffic control signals, street lighting systems, storm sewers, pedestrian subways or overhead crossings, sidewalks and off-street parking facilities, and the like, the Village will require an Apprenticeship and Training Certification, attached after the Bidder's Certification.

30.6 Any bond furnished as security for performance shall include a provision that guarantees faithful performance of the Illinois Prevailing Wage Act, 820 ILCS 130/1 et seq.

31. PATRIOT ACT COMPLIANCE

31.1 The Contractor represents and warrants to the Village that neither it nor any of its principals, shareholders, members, partners, or affiliates, as applicable, is a person or entity named as a Specially Designated National and Blocked Person (as defined in Presidential Executive Order 13224) and that it is not acting, directly or indirectly, for or on behalf of a Specially Designated National and Blocked Person. The Contractor further represents and warrants to the Village that the it and its principals, shareholders, members, partners, or affiliates, as applicable are not, directly or indirectly, engaged in, and are not facilitating, the transactions contemplated by this Contract on behalf of any person or entity named as a Specially Designated National and Blocked Person. The Contractor hereby agrees to defend, indemnify and hold harmless the Village, and its elected or appointed officers, employees, agents, representatives, engineers and attorneys, from and against any and all claims, damages, losses, risks, liabilities and expenses (including reasonable attorney's fees and costs) arising from or related to any breach of the foregoing representations and warranties.

32. INSURANCE REQUIREMENTS

32.1 Prior to starting the Work, Contractor and any Subcontractors shall procure, maintain and pay for such insurance as will protect against claims for bodily injury or death, or for damage to property, including loss of use, which may arise out of operations by the Contractor or Subcontractor or any Sub-Sub Contractor or by anyone employed by any of them, or by anyone for whose acts any of them may be liable. Such insurance shall not be less than the greater of coverages and limits of liability specified below or any coverages and limits of liability specified in the Contract Documents or coverages and limits required by law unless otherwise agreed to by the Village.

Workers Compensation	$500,000	Statutory
Employers Liability	$1,000,000	Each Accident
	$1,000,000	Disease Policy Limit
	$1,000,000	Disease Each Employee
Comprehensive General Liability	$2,000,000	Each Occurrence
	$2,000,000	Aggregate
		(Applicable on a Per Project Basis)
Commercial Automobile Liability	$1,000,000	Each Accident
Professional Errors & Omissions (pursuant to section.9 below)	$2,000,000	Each Claim
	$2,000,000	Annual Aggregate
Umbrella Liability	$ 5,000,000	

32.2 Comprehensive General Liability Insurance required under this paragraph shall be written on an occurrence form and shall include coverage for Products/Completed Operations, Personal Injury with Employment Exclusion (if any) deleted, Blanket XCU and Blanket Contractual Liability insurance

applicable to defense and indemnity obligations and other contractual indemnity assumed under the Contract Documents. The limit must be on a "Per Project Basis".

32.3 Commercial Automobile Liability Insurance required under this paragraph shall include coverage for all owned, hired and non-owned automobiles.

32.4 Workers Compensation coverage shall include a waiver of subrogation against the Village.

32.5 Comprehensive General Liability, Employers Liability and Commercial Automobile Liability Insurance may be arranged under single policies for full minimum limits required, **or** by a combination of underlying policies with the balance provided by Umbrella and/or Excess Liability policies.

32.6 Contractor and all Subcontractors shall have their respective Comprehensive General Liability (including products/completed operations coverage), Employers Liability, Commercial Automobile Liability, and Umbrella/Excess Liability policies endorsed to add the "Village of Downers, its officers, officials, employees and volunteers" as "additional insureds" with respect to liability arising out of operations performed; claims for bodily injury or death brought against the Village by any Contractor or Subcontractor employees, or the employees of Subcontractor's subcontractors of any tier, however caused, related to the performance of operations under the Contract Documents. Such insurance afforded to the Village shall be endorsed to provide that the insurance provided under each policy shall be ***Primary and Non-Contributory***.

32.7 Contractor and all Subcontractors shall maintain in effect all insurance coverages required by the Contract Documents at their sole expense and with insurance carriers licensed to do business in the State of Illinois and having a current A. M. Best rating of no less than A- VIII. In the event that the Contractor or any Subcontractor fails to procure or maintain any insurance required by the Contract Documents, the Village may, at its option, purchase such coverage and deduct the cost thereof from any monies due to the Contractor or Subcontractor, or withhold funds in an amount sufficient to protect the Village, or terminate this Contract pursuant to its terms.

32.8 All insurance policies shall contain a provision that coverages and limits afforded hereunder shall not be canceled, materially changed, non-renewed or restrictive modifications added, without thirty (30) days prior written notice to the Village. Renewal certificates shall be provided to the Village not less than five (5) days prior to the expiration date of any of the required policies. All Certificates of Insurance shall be in a form acceptable to the Village and shall provide satisfactory evidence of compliance with all insurance requirements. The Village shall not be obligated to review such certificates or other evidence of insurance, or to advise Contractor or Subcontractor of any deficiencies in such documents, and receipt thereof shall not relieve the Contractor or Subcontractor from, nor be deemed a waiver of the right to enforce the terms of the obligations hereunder. The Village shall have the right to examine any policy required and evidenced on the Certificate of Insurance.

32.9 If the Work under the Contract Documents includes design, consultation, or any other professional services, Contractor or the Subcontractor shall procure, maintain, and pay for Professional Errors and Omissions insurance with limits of not less than $2,000,000 per claim and $2,000,000 annual aggregate. If such insurance is written on a claim made basis, the retrospective date shall be prior to the start of the Work under the Contract Documents. Contractor and all Subcontractors agree to maintain such coverage for three (3) years after final acceptance of the Project by the Village or such

longer period as the Contract Documents may require. Renewal policies during this period shall maintain the same retroactive date.

32.10 Any deductibles or self-insured retentions shall be the sole responsibility of the Insured. At the option of the Village, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Village, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

33. INDEMNITY AND HOLD HARMLESS AGREEMENT

33.1 To the fullest extent permitted by law, the Contractor shall indemnify, keep and save harmless the Village and its agents, officers, and employees, against all injuries, deaths, strikes, losses, damages, claims, suits, liabilities, judgments, costs and expenses, which may arise directly or indirectly from any negligence or from the reckless or willful misconduct of the Contractor, its employees, or its subcontractors.

33.2 The Contractor shall, at its own expense, appear, defend and pay all charges of attorneys and all costs and other expenses arising therefrom or incurred in connection therewith, and, if any judgment shall be rendered against the Village in any such action, the Contractor shall, at its own expense, satisfy and discharge the same. This agreement shall not be construed as requiring the Contractor to indemnify the Village for its own negligence. The Contractor shall indemnify, keep and save harmless the Village only where a loss was caused by the negligent, willful or reckless acts or omissions of the Contractor, its employees, or its subcontractors.

34. SUBLETTING OF CONTRACT

34.1 No contract awarded by the Village shall be assigned or any part subcontracted without the written consent of the Village. In no case shall such consent relieve the Contractor from his obligation or change the terms of this Contract.

All approved subcontracts shall contain language which incorporates the terms and conditions of this Contract.

35. TERMINATION OF CONTRACT

35.1 The Village reserves the right to terminate the whole or any part of this Contract, upon written notice to the Contractor, for any reason.

35.2 The Village further reserves the right to terminate the whole or any part of this Contract, upon written notice to the Contractor, in the event of default by the Contractor. Default is defined as failure of the Contractor to perform any of the provisions of this Contract or failure to make sufficient progress so as to endanger performance of this Contract in accordance with its terms. In the event that the Contractor fails to cure the default upon notice, and the Village declares default and termination, the Village may procure, upon such terms and in such manner as it may deem appropriate, supplies or services similar to those so terminated. The Village may also contact the issuer of the Performance Bond to complete the Work. The Contractor shall be liable for any excess costs for such similar supplies or services. Any such excess costs incurred by the Village may be set-off against any monies due and owing by the Village to the Contractor.

36. BILLING AND PAYMENT PROCEDURES

36.1 Payment will be made upon receipt of an invoice referencing Village purchase order number. Once an invoice and receipt of materials or service have been verified, the invoice will be processed for payment in accordance with the Village's payment schedule. The Village will comply with the Local Government Prompt Payment Act, 50 ILCS 505/1 et seq., in that any bill approved for payment must be paid or the payment issued to the Contractor within 60 days of receipt of a proper bill or invoice. If payment is not issued to the Contractor within this 60-day period, an interest penalty of 1.0% of any amount approved and unpaid shall be added for each month or fraction thereof after the end of this 60-day period, until final payment is made.

36.2 The Village shall review each bill or invoice in a timely manner after its receipt. If the Village determines that the bill or invoice contains a defect making it unable to process the payment request, the Village shall notify the Contractor as soon as possible after discovering the defect pursuant to rules promulgated under 50 ILCS 505/1 et seq. The notice shall identify the defect and any additional information necessary to correct it.

36.3 As this Contract is for work defined as a "fixed public work" project under the Illinois Prevailing Wage Act, 820 ILCS 130/2, any contractor or subcontractor is required to submit certified payroll records along with the invoice. No invoice shall be paid without said records.

36.4 Please send all invoices to the attention of: Village of Downers Grove Public Works, 5101 Walnut Ave, Downers Grove, IL 60515.

37. COMPLIANCE WITH OSHA STANDARDS

37.1 Equipment supplied to the Village must comply with all requirements and standards as specified by the Occupational Safety and Health Act. All guards and protectors as well as appropriate markings will be in place before delivery. Items not meeting any OSHA specifications will be refused.

38. CERCLA INDEMNIFICATION

38.1 The Contractor shall, to the maximum extent permitted by law, indemnify, defend, and hold harmless the Village, its officers, employees, agents, and attorneys from and against any and all liability, including without limitation, costs of response, removal, remediation, investigation, property damage, personal injury, damage to natural resources, health assessments, health settlements, attorneys' fees, and other related transaction costs arising under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S.C.A. Sec. 9601, et seq., as amended, and all other applicable statutes, regulations, ordinances, and under common law for any release or threatened release of the waste material collected by the Contractor, both before and after its disposal.

38.2 If the Contractor encounters any waste material governed by the above Act, it shall immediately notify the Village and stop working in the area until the above requirements can be met.

39. COPYRIGHT or PATENT INFRINGEMENT

39.1 The Contractor agrees to indemnify, defend, and hold harmless the Village against any suit, claim, or proceeding brought against the Village for alleged use of any equipment, systems, or services provided by the Contractor that constitutes a misuse of any proprietary or trade secret information or an infringement of any patent or copyright.

40. BUY AMERICA

40.1 The Contractor agrees to comply with 49 U.S.C.5323(j), the Federal Transportation Administration's (FTA) Buy America regulations at 49 C.F.R. Part 661, and any amendments thereto, and any implementing guidance issued by the FTA, with respect to this Contract, when financed by Federal funds (through a grant agreement or cooperative agreement).

40.2 As a condition of responsiveness, the Contractor agrees to submit with its Bid submission, an executed Buy America Certificate, attached hereto.

41. CAMPAIGN DISCLOSURE

41.1 Any contractor, proposer, bidder or vendor who responds by submitting a bid or proposal to the Village of Downers Grove shall be required to submit with its bid submission, an executed Campaign Disclosure Certificate, attached hereto.

41.2 The Campaign Disclosure Certificate is required pursuant to the Village of Downers Grove Council Policy on Ethical Standards and is applicable to those campaign contributions made to any member of the Village Council.

41.3 Said Campaign Disclosure Certificate requires any individual or entity bidding to disclose campaign contributions, as defined in Section 9-1.4 of the Election Code (10 ILCS 5/9-1.4), made to current members of the Village Council within the five (5) year period preceding the date of the bid or proposal release.

41.4 By signing the bid documents, contractor/proposer/bidder/vendor agrees to refrain from making any campaign contributions as defined in Section 9-1.4 of the Election Code (10 ILCS 5/9-1.4) to any Village Council member and any challengers seeking to serve as a member of the Downers Grove Village Council.

42. GUARANTEE PERIOD

42.1

The Contractor shall guarantee all work and provide a maintenance bond for the full amount of the contract, covering a minimum period of one (1) year after approval and acceptance of the Work. The bond shall be in such form as the Village may prescribe, unless otherwise noted in the Specifications, and shall be submitted before receiving final payment. If longer guarantee periods are required, they will be noted in the Special Provisions for this project.

43. SUCCESSORS AND ASSIGNS

43.1 The terms of this Contract will be binding upon and inure to the benefit of the parties and their respective successors and assigns; provided, however, that neither party will assign this Contract in whole or in part without the prior written approval of the other. The Contractor will provide a list of key staff, titles, responsibilities, and contact information to include all expected subcontractors.

44. WAIVER OF BREACH OF CONTRACT

44.1 The waiver by one party of any breach of this Contract or the failure of one party to enforce at any time, or for any period of time, any of the provisions hereof will be limited to the particular instance and will not operate or be deemed to waive any future breaches of this Contract and will not be construed to be a waiver of any provision except for the particular instance.

45. CHANGE ORDERS

45.1 The contract price is a "not-to-exceed" cost. At any time additional work is necessary or requested, and the not-to-exceed price is increased thereby, all parties must agree to any change, addition or price increase in writing.

45.2 Change orders for public works projects which authorize an increase in the contract price that is 50% or more of the original contract price or that authorize or necessitate any increase in the price of a subcontract under the contract that is 50% or more of the original subcontract price must be resubmitted for bidding in the same manner by which the original contract was bid. (50 ILCS 525/1)

46. SEVERABILITY OF INVALID PROVISIONS

46.1 If any provisions of this Contract are held to contravene or be invalid under the laws of any state, country or jurisdiction, contravention will not invalidate the entire Contract, but it will be construed as if not containing the invalid provision and the rights or obligations of the parties will be construed and enforced accordingly.

47 GOVERNING LAW AND VENUE

47.1 This Contract will be governed by and construed in accordance with the laws of the State of Illinois. Venue is proper only in the County of DuPage for state cases or the Northern District of Illinois for federal cases.

48. NOTICE

48.1 Any notice will be in writing and will be deemed to be effectively served when deposited in the mail with sufficient first class postage affixed, and addressed to the party at the party's place of business. Notices shall be addressed to the Village as follows:

Village Manager
Village of Downers Grove
801 Burlington Ave.
Downers Grove, IL 60515

And to the Contractor as designated on the Contract Form.

49. AMENDMENT

49.1 This Contract will not be subject to amendment unless made in writing and signed by all parties.

50. COOPERATION WITH FOIA COMPLIANCE

50.1 Contractor acknowledges that the Freedom of Information Act does apply to public records in possession of the Contractor or a subcontractor. Contractor and all of its subcontractors shall cooperate with the Village in its efforts to comply with the Freedom of Information Act. 5 ILCS 140/1 et seq.

51. EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT

51.1 If the work contemplated by this Contract is funded or financed in whole or in part with State Funds or funds administered by the State, Contractor agrees to comply with the terms of the Employment of Illinois Workers on Public Works Act by employing at least 90% Illinois laborers on the project. 30 ILCS 570/1 et seq. Contractor agrees further to require compliance with this Act by all of its subcontractors.

III. GENERAL PROVISIONS

1. STANDARD SPECIFICATIONS

1.1 The following standards shall govern the construction of the proposed improvements:

1.1.1 Standard Specifications for Water and Sewer Main Construction in Illinois, Seventh Edition, 2014 (the Water & Sewer Specs.); and

1.1.2 Standard Specifications for Road and Bridge Construction as adopted by the Illinois Department of Transportation, January 1, 2016; along with Supplemental Specifications and Recurring Special Provisions as adopted by the Illinois Department of Transportation, January 1, 2018 (collectively the "SSRBC"); and

1.1.3 Water Distribution Specifications, Village of Downers Grove, Illinois, revised January 2017.

1.1.4 Standard Detail Drawings, Village of Downers Grove, Illinois revised January, 2018.

1.2 These Contract Documents shall take precedence whenever there are conflicts in the wording or statements made by the above specifications and these Contract Documents.

1.3 Unless otherwise referenced herein, Division I of the Water and Sewer Specs and Section 102 and Articles 104.03, 104.07, 107.02, 107.27, 107.35, 108.10, 108.11, and 108.12 of the SSRBC are hereby ineffective and not a part of this Contract.

2. COOPERATION OF CONTRACTOR

2.1 The Contractor will be supplied with a minimum of 2 sets of approved plans and contract assemblies including Special Provisions, one set of which the Contractor shall keep available on the work site at all times. The Contractor shall give the work site constant attention necessary to facilitate the progress thereof, and shall cooperate with the Village in every way possible.

2.2 The Contractor shall have on the work site at all times, as the Contractor's agent, a competent English-speaking representative capable of reading and thoroughly understanding the Contract Documents, and thoroughly experienced in the type of work being performed. The representative shall also be capable of receiving instruction from the Village, and shall have full authority to promptly respond to such instruction. He shall be capable of supplying such materials, equipment, tools, labor and incidentals as may be required. The Contractor shall not replace him without prior written notification to the Village.

3. LEGAL REGULATIONS AND RESPONSIBILITY TO THE PUBLIC

3.1 Section 107 of the SSRBC shall govern the Contractor's legal regulations and responsibility to the public, with the following additions:

3.1.1 PROJECT SAFETY. Add the following to Article 107.28:

3.1.1.1 The Contractor shall conduct his work in such a manner as to provide an environment consistent with the safety, health and well being of those engaged in

the completion of the Work specified in this Contract.

3.1.1.2 The Contractor shall comply with all State and Federal Safety Regulations as outlined in the latest revisions of the Federal Construction Safety Standards (Series 1926) and with applicable provisions and/or regulations of the Occupation Safety and Health Administration (OSHA) and Standards of the Williams-Stelger Occupational Health Safety Act of 1970 (Revised). SPECIAL ATTENTION SHALL BE PAID TO COMPLIANCE WITH OSHA'S SUBPART P – EXCAVATIONS STANDARD.

3.1.1.3 The Contractor and Village shall each be responsible for their own respective agents and employees.

3.1.1.4 The Contractor shall, prior to performing any work, request information from the Village regarding any existing confined spaces owned by the Village that may be entered in the course of the work, and shall obtain all required confined space entry permits prior to entering any confined spaces. Contractor shall follow all current laws and regulations with regard to confined space entry. Contractor shall maintain and, upon request, provide full documentation of compliance with the appropriate confined space permits for each separate confined space entered on the project.

3.1.2 BACKING PRECAUTIONS. Pursuant to Sections 14-139(b) and 14-171.1 of the Downers Grove Municipal Code, any motor vehicle which has an obstructed view to the rear and is to be operated at any time in reverse gear on the public streets of the Village by the Contractor or any subcontractor shall either be equipped with a reverse signal alarm (backup alarm) audible above and distinguishable from the surrounding noise level, or shall provide an observer to signal that it is safe to back up.

3.1.3 OVERWEIGHT, OVERWIDTH AND OVERHEIGHT PERMITS. The Village has and supports an overweight truck enforcement program. Contractors are required to comply with weight requirements and safety requirements as established by Illinois Law or Village Ordinance, for vehicles, vehicle operators and specialty equipment. In some instances, specialty equipment for road repairs or construction projects requires the movement of overweight, overwidth, or overheight loads utilizing a Village roadway. Such movement will require obtaining a permit from the Village Police Department's Traffic Supervisor.

3.1.4 BARRICADES AND WARNING SIGNS. The Contractor shall provide the Village with a telephone number of a person or company who is available 24 hours per day, seven days per week, to erect additional barricades or signs. If the Village or its representative deems it necessary for the Public's safety to erect additional barricades or signs during normal working hours, the Contractor will furnish the necessary barricades or signs, and have them in place within 30 minutes. If, after normal working hours, the requested signs are not in place within three hours after the request is made, the Village reserves the right to have the barricades and signs erected. The cost of erecting the barricades and signs shall be deducted by the Village from any payments due the Contractor.

4. PROSECUTION AND PROGRESS

4.1 Section 108 of the SSRBC shall govern the prosecution and progress of the work, with the following additions:

4.1.1 The Contractor shall schedule his work such that all improvements shall be complete within 30 calendar days of the notice to proceed. The completion date will remain binding throughout the duration of the Contract unless revised in writing by the Village.

4.1.2 The total duration of disturbance for work related to means of public egress through the project site or access to private property (e.g. removal and replacement of curb and gutters, sidewalks, driveway entrances, etc.) must not exceed ten (10) calendar days. The Contractor may use high-early strength concrete, meeting all specifications herein, **at his own expense** to help meet this requirement.

4.1.3 The Contractor shall also make special note of the following work schedule requirements:
(a) N/A

4.1.4 Should the Contractor fail to complete the work on or before the specified completion dates set forth in Sections 4.1.1, 4.1.2, 4.1.3, or within such extended time as may be allowed, the Contractor shall be liable for liquidated damages in accordance with the applicable sections of Article 108.09 of the SSRBC.

4.1.5 Prior to commencing construction, a meeting will be held with the Contractor and the Village. Any questions concerning procedures, general conditions, special provisions, plans or specific items related to the project shall be answered and clarified. No Pre-Construction meeting shall be scheduled until submittals, performance bonds, and certificates of insurance are delivered to, and approved by, the Village.

4.1.6 Weekly progress meetings may be required by the Village. If required, the Contractor shall have a capable person, such as a site superintendent or project manager, attend such meetings and be prepared to report on the prosecution of the Work according to the progress schedule. The Village reserves the right to require adjustments to scheduling of work.

5. MEASUREMENT AND PAYMENT

5.1 Section 109 of the SSRBC shall govern measurement and payment, with the following additions:

5.1.1 Modifies Article 109.07 - Partial payments will be made per Section 36 of Part II of this document (Billing and Payment Procedures.)

5.1.2 The Village will require that partial and final affidavits for all labor, materials and equipment used on the Project and certified payroll records, be submitted with the partial and final payment requests. Such waivers shall indicate that charges for all labor, materials and equipment used on the project have been paid. Partial waivers from suppliers and subcontractors may be submitted after the first payment to the Contractor, and before the

subsequent payment to that which they apply. However, partial waivers from the Contractor must accompany the invoice of the payment to which it applies. All final waivers, from all suppliers and subcontractors MUST accompany the Contractor's invoice upon submittal for final payment. A sworn statement by the Contractor shall accompany full waivers. Such requirement for full waivers is solely for the benefit of the Village and shall not be construed to benefit any other person. Partial payment for work done shall in no way imply acceptance of the work to that date.

5.1.3 For each progress payment made to the Contractor prior to acceptance of the Work by the Village, the Village shall have the right to retain ten percent (10%) of the amount due to the Contractor for each such payment. The Village may, in its sole discretion, reduce the amount to be retained at any time.

Typically, upon completion of 50% of the work, as determined by the Engineer, retainage may be reduced to 5%. Upon substantial completion, as determined by the Engineer, retainage may be reduced to 2%. Additionally, the Village has the right to withhold an amount of money equivalent to complete unfinished work and/or work that may need to be redone.

6. SCOPE OF WORK

6.1 In addition to the Special Provisions in the Detailed Specifications Section below, Section 104 of the SSRBC shall govern scope of work, with the following revisions:

6.1.1 Modify Article 104.02 as follows:

104.02 Alterations, Cancellations, Extensions, Deductions, and Extra Work.

The Department reserves the right to make, in writing, at any time during work, changes in quantities, alterations in work, and the performance of extra work to satisfactorily complete the project. Such changes in quantities, alterations, and extra work shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.

If alterations or changes in quantities do not significantly change the character of the work to be performed under contract, the altered work will be paid for as provided elsewhere in the contract. The term "significant change" shall be construed to apply only when the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction ~~or when a major item, defined as an item whose total original contract cost plus any additions exceeds ten percent of the total original contract amount, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity.~~

All alterations, cancellations, extensions, and deductions shall be authorized in writing by the Engineer before work is started. Such authorizations shall set up the items of work involved and the method of payment for each item. The Contractor shall accept payment for alterations which result in an increase or decrease in the quantities of work to be performed according to the following.

(a) All increases in work of the type which appear in the contract as pay items accompanied by unit prices will, except as provided under paragraph (d) herein, be paid for at the contract unit prices. Decreases in quantities included in the contract will be deducted from the contract at the unit bid prices. No allowance will be made for delays or anticipated profits.

(b) Major items of work for which the quantities are increased ~~by not more than 125 percent or reduced to not less than 75 percent of the original contract quantities~~ OR DECREASED will be paid for as specified in paragraph (a) above. ~~Any adjustments for increased quantities for major items of work increased more than 125 percent shall only apply to that portion in excess of 125 percent of original contract quantities. Any adjustments made for major items of work which are decreased to less than 75 percent of the original contract quantities shall apply to the actual amount of work performed.~~

(c) Extra work which is not included in the contract as pay items at unit prices and is not included in other items of the contract will be paid for according to Article 109.04.

(d) Extra work for which there is a pay item at unit price in the contract which for any one or more of the following reasons materially increases or decreases the cost of the pay item as bid and which is not included in the prices bid for other items in the contract will be paid for according to Article 109.04. This includes:

(1) Work involving a substantial change of location.

(2) Work which differs in design.

(3) Work requiring a change in the type of construction.

(e) In cases where the Department cancels or alters any portion of the contract items, items which are partially completed will be paid for as specified in Article 109.06.

Claims for extra work which have not been authorized in writing by the Engineer will be rejected.

IV. SPECIAL PROVISIONS

The following Special Provisions shall modify, supercede, or supplement the Standard Specifications referred to in Section III - General Provisions.

Where any section, subsection, paragraph, or subparagraph of the Standard Specifications is *supplemented* by any of the following paragraphs, the provisions of such section, subsection, paragraph, or subparagraph shall remain in effect. The Special Provisions shall govern in addition to the particular Standard Specification so supplemented, and not in lieu thereof.

Where any section, subsection, paragraph, or subparagraph of the Standard Specifications is *amended, voided, or superceded* by any of the following paragraphs, any provision of such section, subsection, paragraph, or subparagraph standing unaffected, shall remain in effect. The Special Provisions shall govern in lieu of any particular provision of the Standard Specification so amended, voided, or superceded, and not in addition to the portion changed.

SP-1 SCOPE OF WORK

This work consists of the application of preservative and restorative seal on various asphalt roads throughout the Village of Downers Grove.

MALTENE-BASED ASPHALT REJUVENATOR

A. **General Scope:** This work shall consist of furnishing all labor, material and equipment necessary to perform all operations for the application of an Emulsified Maltene-Based Asphalt Rejuvenating agent to bituminous asphaltic concrete surface courses. The rejuvenation of surface courses shall be by spray application of a cationic Maltene-Based Rejuvenating Agent composed of petroleum oils and resins emulsified with water. The base used for the emulsion shall be naphthenic. All work shall be in accordance with the specifications, any applicable drawings, and subject to the terms and conditions of this contract.

B. **Pre-Construction:** The CONTRACTOR shall present samples of materials, laboratory reports, calibration reports, and proof of work experience as required by these specifications to the Resident Engineer at the pre-construction meeting.

C. **Material Specifications:** The emulsion will be a naphthenic, maltene-based rejuvenating agent composed of four maltene components (listed below) uniformly emulsified with water. Each bidder must submit with his bid a certified statement from the asphalt rejuvenator manufacturer showing that the asphalt rejuvenating emulsion conforms to the required physical and chemical requirements.

NAPHTHENIC MALTENE-BASED ASPHALT REJUVENATOR SPECIFICATIONS:

Property	Test Method ASTM	Requirements Min.	Max.
Tests on Emulsion:			
Viscosity @ 25°C, SFS	D-244	15	40
Residue, w%	D-244 (Mod)[3]	60	65
Miscibility Test	D-244 (Mod.)[2]	No Coagulation	
Sieve Test, w%	D-244 (Mod.)[1]	---	0.1
Particle Charge Test	D-244	Positive	
Tests on Distillation Residue:			
Flash Point, COC, °C	D-92	196	---
Viscosity@ 60°C, cSt	D-445	100	200
Asphaltenes, %w	D-2006-70		0.75
Maltene Dist. Ratio $\frac{\text{(Polar Compounds)} + (1^{st}\ \text{Acidaffins})}{\text{(Saturates)} + (2^{nd}\ \text{Acidaffins})}$	D-2006-70	0.3	0.6
Polar Compounds/Saturates Ratio	D-2006-70	0.5	---
Saturated Hydrocarbons, S	D-2006-70	21	28

[1]Test procedure identical with ASTM D-244 60 except that distilled water shall be used in place of two percent (2%) sodium oleate solution.

[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]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.

D. **Material Performance:** The rejuvenating agent shall have record of at least two years of satisfactory service as asphalt rejuvenating agent and in-depth sealer. Satisfactory service shall be based on the capability of the material to penetrate, replace lost maltene fractions, and decrease the viscosity and increase the penetration value of the in-place asphalt binder as follows; the viscosity shall be reduced by a minimum of forty-five (45) percent, the penetration value shall be increased by a minimum of twenty-five (25) percent. Testing shall be performed by an independent testing laboratory on extracted asphalt cement from pavement to a depth of three-eighths inch (3/8"). In addition, the pavement shall be in-depth sealed to prevent the intrusion of air and water.
The bidder must submit with their bid:

1. Asphalt Rejuvenator product name and descriptive literature. Literature shall be descriptive and detailed information and shall show it at least meets the material specifications.

2. A current Material Safety Data Sheet (MSDS) for the material.

3. The manufacturer's certification that the material proposed for use is in compliance with these specification requirements.

4. Previous use documentation and test data conclusively demonstrating that the rejuvenating agent has been used successfully for a period of two years by government agencies such as Cities, Counties, or DOT's.

5. Testing data from a minimum of five projects showing that the asphalt rejuvenating agent has been proven to perform, as heretofore required, through field testing by an independent testing laboratory as to the required change in the asphalt binder viscosity and penetration number.

E. **Product Standards**: The product "Reclamite"® produced by Tricor Refining, LLC is the standard for the naphthenic emulsified maltene-based asphalt rejuvenating agent requirements and the prices quoted on the Bid Sheet Base Bid shall be for "Reclamite" or approved equal. If an alternate material is proposed, bidder must submit the above referenced material specifications and testing data **along with their bid** to be reviewed by the Village, and bidder must clearly state on the bid form that the bid pricing is not based on "Reclamite", but rather an alternate material. Submittal of an alternate material which does not meet or exceed the requirements in these specifications may be justification for disqualification of a bid. The determination of a product's suitability as an equal alternative to Reclamite shall be solely based on the judgment of the Village.

F. **Applicator Experience:** The asphalt rejuvenating agent shall be applied by an experienced applicator of such material. The bidder shall have a minimum of five (5) years' experience in applying the product proposed for use on municipal streets. The Contractor must submit with his bid a list of five (5) 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 manager in charge of each project.

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

G. **Application Temperature and Weather Limitations:** The temperature of the asphalt rejuvenation 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 there is no likelihood of precipitation forecasted within twenty-four (24) hours of application. The asphalt rejuvenating agent shall not be applied when the ambient temperature is below 45 degrees Fahrenheit or when temperatures are forecasted to fall below 40 degrees Fahrenheit within twenty-four (24) hours of application. It shall be the discretion of the Engineer to determine when weather conditions are not appropriate for the application to occur. Contractor shall halt the application process when so ordered by the Engineer.

H. **Handling of Asphalt Rejuvenating Agent:** Contents in tank cars or storage tanks shall be circulated at least forty-five minutes before withdrawing any material 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 (2) 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 inspection and the Contractor shall halt the application process when so ordered by the Engineer.

I. **Application 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 asphalt 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 five (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 Engineer. 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 1.5 pounds to 3 pounds of sand per square yard in a single pass. The spreader shall be adjustable so as to not broadcast sand onto driveways or tree lawns. 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 Engineer.

J. **Application of Rejuvenating Agent:** The asphalt rejuvenating agent 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 a hand sprayer application. Application of the asphalt rejuvenating agent shall be on one-half width of the pavement at a time. When the second half of the surface is treated, the nozzle nearest the center of the road shall overlap the previous by at least one-half the width of the nozzle spray. In any event the construction joint of the pavement shall be treated in both passes of the distributor truck. Before spreading, the asphalt rejuvenating agent shall be blended with water at the rate of two (2) parts rejuvenating agent to

one (1) part water, by volume or as specified by the manufacturer. The combined mixture of asphalt 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 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 approval is granted for additional applications by the Engineer. Grades or super elevations of surfaces that may cause excessive runoff in the opinion of the Engineer shall have the required amounts applied in two (2) or more applications as directed. Said treatment shall be uniformly applied by a method acceptable to the Engineer. Care should be taken during all rejuvenator applications to not get excessive material on the curb and gutter. Additional cleaning may be required if this occurs at the contractor's expense. 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 Engineer. The Contractor shall furnish a quality inspection report showing the source and manufacturer of asphalt rejuvenating agent. When directed by the Engineer, the Contractor shall take representative samples of material for testing.

K. **Street Sweeping:** The Contractor shall be responsible for sweeping and cleaning of the streets prior to and after treatment. Prior to treatment, the street will be cleaned of all standing water, dirt, leaves, foreign materials, etc. This work shall be accomplished by hand brooming, power blowing or other methods approved by the Engineer. If hand cleaning is not sufficient, then a self-propelled street sweeper shall be used. All sand used during the treatment must be removed no later than forty-eight (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 and free of any material that would interfere with the treatment. All debris generated by sweeping shall be picked up and disposed of by the contractor. Street sweeping shall be included in the price bid per square yard for asphalt rejuvenating agent. If after sand is swept and it is determined that a hazardous condition exists on the roadway, the Contractor must apply additional sand and sweep no later than twenty-four (24) hours following reapplication. No additional compensation will be allowed for reapplications and removal of sand.

L. **Traffic Control and Safety:** 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 has become complete and the area is suitable for traffic. Cure time shall be no longer than 90 minutes. When traffic must be maintained at all times on a particular street, then the Contractor shall apply asphalt rejuvenating agent to one (1) lane at a time. Traffic shall be maintained in the untreated lane until the traffic may be switched to the completed lane. Access to adjacent properties shall be maintained during the application. The Contractor shall be responsible for all traffic control and signing required to permit safe travel. All signing and barricading of the work zone shall comply with MUTCD guidelines and IDOT standards. The Contractor shall notify the Engineer as to the streets that are to be treated each day. All support vehicles used shall also have flashing beacons that can be seen from all sides of the vehicle, for safety considerations for all work on major arterials. If the Contractor fails to provide the required signing, the Contractor shall stop all operations until safe signing and barricading is achieved.

M. **Spreading of Sand or Screenings:** Contractor shall furnish all materials, equipment, tools, labor and incidentals necessary to perform the sanding operation in accordance with this contract.

Spreading shall consist of applying free flowing sharp sand, FA2 or limestone screenings to insure even distribution of the sand or screenings to be worked into any voids in the payment surface as directed by

customer representative. A twin spinner, rubber belt feed system aggregate distributor shall be used for uniform application. The aggregate distributor shall apply sand or screenings at a rate of two pounds to four pounds per square yard for the restorative application.

Aggregate distributor must be able to carry enough aggregate to cover an applied load of the restoring agent, at least (9) nine tons. Repeated sanding may be required on some areas of pavement and contractor must be available on an as needed basis to provide the required sanding.

N. **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.

O. **Basis of Payment:** Asphalt rejuvenating agent shall be measured by the square yard of material in place and will be paid for at the contract unit price for Maltene-Based Asphalt Rejuvenating Agent per square yard. Prices shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified and required.

SP-2 GENERAL CONSTRUCTION REQUIREMENTS

The following general requirements are intended to govern the overall priority for the performance of the work described in this contract. As general requirements, they are not intended to dictate to the Contractor the precise method by which these tasks shall be performed.

~~All street openings made prior to November 15th shall be fully restored according to the applicable special provisions, and the street reopened to regular traffic upon the availability of hot-mix asphalt. The Contractor shall assume the risk of restoration over those reaches of pipe installed but not yet pressure tested for pipe integrity.~~

~~No more than three hundred linear feet (300 LF) of pavement may be open-cut and closed to use by the motoring public. Access to~~ **all** ~~individual drives within the current work zone must be restored at the end of each workday.~~

The Contractor shall maintain traffic flow on ALL STREETS during the day in accordance with the applicable special provision. Adequate signing and flagging is of particular importance for safe travel of all residents.

SP-3 QUALIFICATIONS OF BIDDER

In addition to those requirements set forth in Section 10.1 above, in order to be considered a responsible bidder, the bidder must have particular expertise in having successfully constructed projects of a similar size and scope, specifically including residential neighborhood concrete sidewalk and curb and gutter removal and replacement. The Bidder must submit the following information for itself and for any major Sub-Contractors:

a. Similar Project Experience

i. Bidder must provide detailed information regarding past similar projects performed by the submitting firm within the past five (5) years.
ii. Bidder must submit a list of references of previous projects identifying the location of the work, the dollar value of the work, the owner or agency responsible for the work, and the name and phone number of the contact person.

b. Proposed Project Team – the Bidder must identify the project manager and full-time onsite construction supervisor (can be the same person) on the Certification of Qualifications form. Bidder must also provide qualifications of the project manager and full-time onsite construction supervisor. The individuals proposed must be utilized for the duration of this project unless an alternate is approved in writing by the Village.

c. Bidder must completely fill out and submit the Certification of Qualifications form with the Bid.

V. BID and CONTRACT FORM (Village)

*****THIS BID WHEN ACCEPTED AND SIGNED BY AN AUTHORIZED SIGNATORY OF THE VILLAGE OF DOWNERS GROVE SHALL BECOME A CONTRACT BINDING UPON BOTH PARTIES.**

Entire Form Must Be Completed If a Submitted Bid Is To Be Considered For Award

BIDDER:

Corrective Asphalt Materials, LLC Company Name	06/25/2019 Date
300 Daniel Boone Trail Street Address of Company	Kelli@cammidwest.com / mike@cammidwest.com E-mail Address
South Roxana, IL 62087 City, State, Zip	Kelli Bornes (Paperwork) Mike Sumrall (Project) Contact Name (Print)
618-254-3855 Business Phone	636-465-4142 24-Hour Telephone
618-254-2200 Business Fax	 Signature of Officer, Partner or Sole Proprietor
ATTEST: if a Corporation	Marc Taillon, Member Print Name & Title
Signature of Corporation Secretary	

We hereby agree to furnish the Village of Downers Grove all necessary materials, equipment, labor, etc. to complete the project within the timeframe specified herein and in accordance with the provisions, instructions and specifications for the unit prices shown on the Schedule of Prices.

VILLAGE OF DOWNERS GROVE:	ATTEST:
Authorized Signature	Village Clerk
Title	
Date	Date

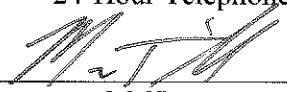
In compliance with the specifications, the above-signed offers and agrees, if this Bid is accepted within **90** calendar days from the date of opening, to furnish any or all of the services upon which prices are quoted, at the price set opposite each item, delivered at the designated point within the time specified above.

V. BID and CONTRACT FORM (Contractor)

*****THIS BID WHEN ACCEPTED AND SIGNED BY AN AUTHORIZED SIGNATORY OF THE VILLAGE OF DOWNERS GROVE SHALL BECOME A CONTRACT BINDING UPON BOTH PARTIES.**

Entire Form Must Be Completed If a Submitted Bid Is To Be Considered For Award

BIDDER:

Corrective Asphalt Materials, LLC Company Name	06/25/2019 Date
300 Daniel Boone Trail Street Address of Company	kelli@cammidwest.com / mike@cammidwest.com E-mail Address
South Roxana, IL 62087 City, State, Zip	Kelli Bornes (paperwork) / Mike Sumrall (project) Contact Name (Print)
618-254-3855 Business Phone	636-465-4142 24-Hour Telephone
618-254-2200 Business Fax	 Signature of Officer, Partner or Sole Proprietor
ATTEST: if a Corporation	Marc Taillon, Member Print Name & Title
Signature of Corporation Secretary	

We hereby agree to furnish the Village of Downers Grove all necessary materials, equipment, labor, etc. to complete the project within the timeframe specified herein and in accordance with the provisions, instructions and specifications for the unit prices shown on the Schedule of Prices.

VILLAGE OF DOWNERS GROVE:	ATTEST:
Authorized Signature	Village Clerk
Title	
Date	Date

In compliance with the specifications, the above-signed offers and agrees, if this Bid is accepted within **90** calendar days from the date of opening, to furnish any or all of the services upon which prices are quoted, at the price set opposite each item, delivered at the designated point within the time specified above.

SCHEDULE OF PRICES:

Pay Item	Quantity	Units	Unit Price	Total
Maltene-Based Asphalt Rejuvenating Agent	193,312	SY	$0.89	$172,047.68

TOTAL BASE BID $172,047.68

BIDDER'S CERTIFICATION (page 1 of 3)

With regard to Preservative and Restorative Seal for Asphalt Pavements (ST-004E) (Name of Project); Bidder Corrective Asphalt Materials, LLC (Name of Bidder) hereby certifies the following:

1. Bidder is not barred from bidding this Contract as a result of violations of Section 720 ILCS 5/33E-3 (Bid Rigging) or 720 ILCS 5/33E-4 (Bid-Rotating);

2. Bidder certifies that it has a written sexual harassment policy in place and full compliance with 775 ILCS 5/2-105(A)(4);

3. Bidder certifies that not less than the prevailing rate of wages as determined by the Village of Downers Grove, DuPage County or the Illinois Department of Labor shall be paid to all laborers, workers and mechanics performing work for the Village of Downers Grove. All bonds shall include a provision as will guarantee the faithful performance of such prevailing wage clause. Bidder agrees to comply with the Illinois Prevailing Wage Act, 820 ILCS 130/1 *et seq.*, for all work completed. Bidder agrees to pay the prevailing wage and require that all of its subcontractors pay prevailing wage to any laborers, workers or mechanics who perform work pursuant to this Contract or related subcontract. Bidder and each subcontractor shall keep or cause to be kept an accurate record of names, occupations and actual wages paid to each laborer, workman and mechanic employed by the Bidder in connection with the contract. This record shall be sent to the Village on a monthly basis along with the invoice and shall be open to inspection at all reasonable hours by any representative of the Village or the Illinois Department of Labor and must be preserved for five (5) years following completion of the contract. Bidder certifies that Bidder and any subcontractors working on the project are aware that filing false payroll records is a Class A misdemeanor and that the monetary penalties for violations are to be paid pursuant to law by the Bidder, contractor and subcontractor. The Village shall not be liable for any underpayments. If applicable: Since this is a contract for a fixed public works project, as defined in 820 ILCS 130/2, Contractor agrees to post at the job site in an easily accessible place, the prevailing wages for each craft or type of worker or mechanic needed to execute the contract or work to be performed;

4. Bidder certifies that it is in full compliance with the Federal Highway Administrative Rules on Controlled Substances and Alcohol Use and Testing, 49 C.F.R. Parts 40 and 382 and that all employee drivers are currently participating in a drug and alcohol testing program pursuant to the Rules;

5. Bidder further certifies that it is not delinquent in the payment of any tax administered by the Department of Revenue, or that Bidder is contesting its liability for the tax delinquency or the amount of a tax delinquency in accordance with the procedures established by the appropriate Revenue Act. Bidder further certifies that if it owes any tax payment(s) to the Department of Revenue, Bidder has entered into an agreement with the Department of Revenue for the payment of all such taxes that are due, and Bidder is in compliance with the agreement.

BIDDER'S CERTIFICATION (page 2 of 3)

BY: _____
Bidder's Authorized Agent

3	7	-	1	3	5	9	5	7	5

FEDERAL TAXPAYER IDENTIFICATION NUMBER

or _____
Social Security Number

Subscribed and sworn to before me

this 25th day of June, 2019.

Kelli Leighanne Bornes
Notary Public

KELLI LEIGHANNE BORNES
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
July 11, 2022

(Fill Out Applicable Paragraph Below)

(a) **Corporation**

The Bidder is a corporation organized and existing under the laws of the State of _____, which operates under the Legal name of _____, and the full names of its Officers are as follows:

President: _____

Secretary: _____

Treasurer: _____

and it does have a corporate seal. (In the event that this bid is executed by other than the President, attach hereto a certified copy of that section of Corporate By-Laws or other authorization by the Corporation which permits the person to execute the offer for the corporation.)

Limited Liability Company (LLC)

The Bidder is a LLC organized and existing under the laws of the State of Illinois, which operates under the legal name of Corrective Asphalt Materials, LLC, and the full names of its managers or members are as follows:

Manager or Member: Anthony J Witte, Jr - Member

Manager or Member: Marc Taillon - Member

Manager or Member: Tina Revermann - Manager

Manager or Member: Rachel Lang - Manager

BIDDER'S CERTIFICATION (page 3 of 3)

(c) **Partnership**
The partnership does business under the legal name of: _____ ,
which name is registered with the office of _____ in the State of
_____.

Names and Addresses of All Partners:

_____

_____

_____

_____

(d) **Sole Proprietor**
The Bidder is a Sole Proprietor whose full name is: _____; and if operating under a trade name, said trade name is: _____, which name is registered with the office of _____ in the State of _____.

6. Are you willing to comply with the Village's insurance requirements within 10 days of the award of the contract? (YES) NO (circle one)

INSURER`S NAME: Acuity

AGENT: USI Insurance Services LLC

Street Address: 308 North 21st Street

City, State, Zip Code: St. Louis, MO 63103

Telephone Number: 314-436-2399

I/We hereby affirm that the above certifications are true and accurate and that I/we have read and understand them.

Print Name of Company: Corrective Asphalt Materials, LLC

Print Name and Title of Authorizing Signature: Marc Taillon, Member

Signature: _____

Date: June 25, 2019

MUNICIPAL REFERENCE LIST

Municipality: City of Bloomington
Address: 115 E. Washington St., PO Box 3157, Bloomington, IL 61702
Contact Name: Jeffrey Kohl Phone #: 309-275-1633
Name of Project: Bloomington Pavement Preservation FY2014
Contract Value: $159,730.55 Date of Completion: 09/24/2014

Municipality: DeKalb County Highway Dept.
Address: 1826 Barber Green Road, DeKalb, IL, 60115
Contact Name: Nathan Schwartz Phone #: 815-756-9513
Name of Project: DeKalb County Rejuvenator
Contract Value: $175,494.60 Date of Completion: 05/18/2015

Municipality: Peter Baker & Sons (For McHenry County, IL)
Address: 1349 Rockland Road, Lake Bluff, IL 6044
Contact Name: John Brunner Phone #: 847-362-3663
Name of Project: McHenry County-Various Roads
Contract Value: $160,274.50 Date of Completion: 06/30/2016

Municipality: Microsurfacing Contracts (for Kane County, IL)
Address: 41W011 Burlington Road, St. Charles, IL 60175
Contact Name: Patrick Verhalen (Kane County) Phone #: 630-208-3138
Name of Project: Kane County-Various Roads
Contract Value: $234,658.58 Date of Completion: 07/14/2017

Municipality: City of Elmhurst
Address: 209 North York St., Elmhurst, IL, 60126
Contact Name: Kim McGrew Phone #: 630-530-3122
Name of Project: 2018 Asphalt Rejuvenating Treatment Contract
Contract Value: $192,205.71 Date of Completion: 10/09/2018

SUBCONTRACTORS LIST

The Bidder hereby states the following items of work will not be performed by its organization. (List items to be subcontracted as well as the names, addresses and phone numbers of the subcontractors.)

1) SJS Contractors, Inc Type of Work Sweeping

Addr: PO Box 368 City Hampshire State IL Zip 60140

2) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

3) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

4) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

5) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

6) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

7) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

8) _____ Type of Work _____

Addr: _____ City _____ State____ Zip_____

CERTIFICATION OF QUALIFICATIONS

Project Team *We have to crews that could potentially be scheduled on this project. This is the names are separated.

Project Manager: Mike Sumrall

Construction Supervisor: Jack Holleran / Wade Sparks

Team Member: Thomas Thurman / George Winckler

Team Member: Kristopher Cotton / Daniel Hestekin

Team Member: Jonathon Fitzgerald / Christopher Parker

Team Member: Marcus Kurzinski

Team Member:

Team Member:

☒ By checking this box, the bidder hereby certifies that it complies with all requirements of SP-3 including at least three (3) contracts of similar nature and scope within the last five (5) years, and can provide detailed supporting information upon request.

Signed by: _____ (Corporate Seal)

Title: Marc Taillon, Member

Name & Address: Corrective Asphalt Materials, LLC

of Contractor 300 Daniel Boone Trail

or Vendor South Roxana, IL 62087

Subscribed and sworn to before
me this 25th day of June , 2019

Kelli Leighanne Borner
Notary Public
Kelli Leighanne Bornes

KELLI LEIGHANNE BORNES
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
July 11, 2022

VENDOR W-9 REQUEST FORM

The law requires that we maintain accurate taxpayer identification numbers for all individuals and partnerships to whom we make payments, because we are required to report to the I.R.S all payments of $600 or more annually. We also follow the I.R.S. recommendation that this information be maintained for all payees including corporations.

Please complete the following substitute W-9 letter to assist us in meeting our I.R.S. reporting requirements. The information below will be used to determine whether we are required to send you a Form 1099. Please respond as soon as possible, as failure to do so will delay our payments.

BUSINESS (PLEASE PRINT OR TYPE):

NAME: Corrective Asphalt Materials, LLC

ADDRESS: 300 Daniel Boone Trail

CITY: South Roxana

STATE: IL

ZIP: 62087

PHONE: 618-254-3855 **FAX:** 618-254-2200

TAX ID #(TIN): 37-1359575

(If you are supplying a social security number, please give your full name)

REMIT TO ADDRESS (IF DIFFERENT FROM ABOVE):

NAME:

ADDRESS:

CITY:

STATE: **ZIP:**

TYPE OF ENTITY (CIRCLE ONE):

Individual	Limited Liability Company – Member-Managed
Sole Proprietor	Limited Liability Company- Manager-Managed
Partnership	Medical Corporation
Charitable/Nonprofit	Government Agency

SIGNATURE: **DATE:** 06/25/2019

Apprenticeship and Training Certification

(Does not apply to federal aid projects. Applicable only to maintenance and construction projects that use Motor Fuel Tax funds or state grant monies.)

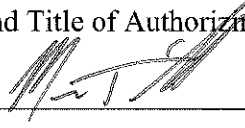
Name of Bidder: Corrective Asphalt Materials, LLC

In accordance with the provisions of Section 30-22 (6) of the Illinois Procurement Code, the Bidder certifies that it is a participant, either as an individual or as part of a group program, in the approved apprenticeship and training programs applicable to each type of work or craft that the bidder will perform with its own forces. The Bidder further certifies for work that will be performed by subcontract that each of its subcontractors submitted for approval either (a) is, at the time of such bid, participating in an approved, applicable apprenticeship and training program; or (b) will, prior to commencement of performance of work pursuant to this Contract, begin participation in an approved apprenticeship and training program applicable to the work of the subcontract. The Illinois Department of Labor, at any time before or after award, may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and any or all of its subcontractors. Applicable apprenticeship and training programs are those that have been approved and registered with the United States Department of Labor. The Bidder shall list in the space below, the official name of the program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the Bidder is a participant and that will be performed with the Bidder's forces. Types of work or craft work that will be subcontracted shall be included and listed as subcontract work. The list shall also indicate any type of work or craft job category that does not have an applicable apprenticeship or training program. **The Bidder is responsible for making a complete report and shall make certain that each type of work or craft job category that will be utilized on the project is accounted for and listed. Return this with the Bid.**

Associated Builders and Contractors, Inc - Illinois Chapter

The requirements of this certification and disclosure are a material part of the Contract, and the Contractor shall require this certification provision to be included in all approved subcontracts. In order to fulfill this requirement, it shall not be necessary that an applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this Contract.

Print Name and Title of Authorizing Signature: Marc Taillon, Member

Signature: 

Date: 06/25/2019

BUY AMERICA CERTIFICATION

Certification requirement for procurement of steel, iron, or manufactured products when Federal funds (Grant Agreement or Cooperative Agreement) are used.

Instructions:
Bidder to complete the Buy America Certification listed below. Bidder shall certify EITHER COMPLIANCE OR NON-COMPLIANCE (not both). This Certification MUST BE submitted with the Bidder's bid response.
Special Note: Make sure you have signed only one of the above statements – either Compliance OR Non-Compliance (not both).

Certificate of Compliance

The bidder or offeror hereby certifies that it **will meet** the requirements of 49 U.S.C. 5323(j)(1), as amended, and the applicable regulations in 49 CFR Part 661.

Signature _____

Company Name Corrective Asphalt Materials, LLC

Title Marc Taillon, Member

Date 06/25/2019

Certificate of Non-Compliance

The bidder or offeror hereby certifies that it **cannot comply** with the requirements of 49 U.S.C. 5323(j)(1), as amended, and 49 C.F.R. 661, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Signature _____

Company Name _____

Title _____

Date _____

AFTER THIS CERTIFICATE HAS BEEN EXECUTED, A BIDDER MAY NOT SEEK A WAIVER.

Note: The U.S/Canadian Free Trade Agreement does not supersede the Buy America requirement.

Suspension or Debarment Certificate

Non-Federal entities are prohibited from contracting with or making sub-awards under covered transactions to parties that are suspended or debarred or whose principals are suspended or debarred. Covered transactions include procurement for goods or services equal to or in excess of $100,000.00. Contractors receiving individual awards for $100,000.00 or more and all sub-recipients must certify that the organization and its principals are not suspended or debarred.

By submitting this offer and signing this certificate, the Bidder certifies to the best of its knowledge and belief, that the company and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any federal, state or local governmental entity, department or agency;

2. Have not within a three-year period preceding this Bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction, or convicted of or had a civil judgment against them for a violation of Federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (2) of this certification; and

4. Have not within a three-year period preceding this application/proposal/contract had one or more public transactions (Federal, State or local) terminated for cause or default.

If the Bidder is unable to certify to any of the statements in this certification, Bidder shall attach an explanation to this certification.

Company Name: Corrective Asphalt Materials, LLC

Address: 300 Daniel Boone Trail

City: South Roxana, IL Zip Code: 62087

Telephone: (618) 254-3855 Fax Number: (618) 254-2200

E-mail Address: kelli@cammidwest.com (Admin Assistant) / Mike@cammidwest.com (Operations Manager)

Authorized Company Signature:

Print Signature Name: Mike Tallon Title of Official: Member

Date: 06/25/2019

CAMPAIGN DISCLOSURE CERTIFICATE

Any contractor, proposer, bidder or vendor who responds by submitting a bid or proposal to the Village of Downers Grove shall be required to submit with its bid submission, an executed Campaign Disclosure Certificate.

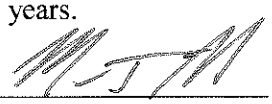
The Campaign Disclosure Certificate is required pursuant to the Village of Downers Grove Council Policy on Ethical Standards and is applicable to those campaign contributions made to any member of the Village Council.

Said Campaign Disclosure Certificate requires any individual or entity bidding to disclose campaign contributions, as defined in Section 9-1.4 of the Election Code (10 ILCS 5/9-1.4), made to current members of the Village Council within the five (5) year period preceding the date of the bid or proposal release.

By signing the bid documents, contractor/proposer/bidder/vendor agrees to refrain from making any campaign contributions as defined in Section 9-1.4 of the Election Code (10 ILCS 5/9-1.4) to any Village Council member and any challengers seeking to serve as a member of the Downers Grove Village Council.

Under penalty of perjury, I declare:

☒ Bidder/vendor has <u>not</u> contributed to any elected Village position within the last five (5) years.



Signature

marc Tailon, member
Print Name

☐ Bidder/vendor has contributed a campaign contribution to a current member of the Village Council within the last five (5) years.

Print the following information:

Name of Contributor: _____
(company or individual)

To whom contribution was made: _____

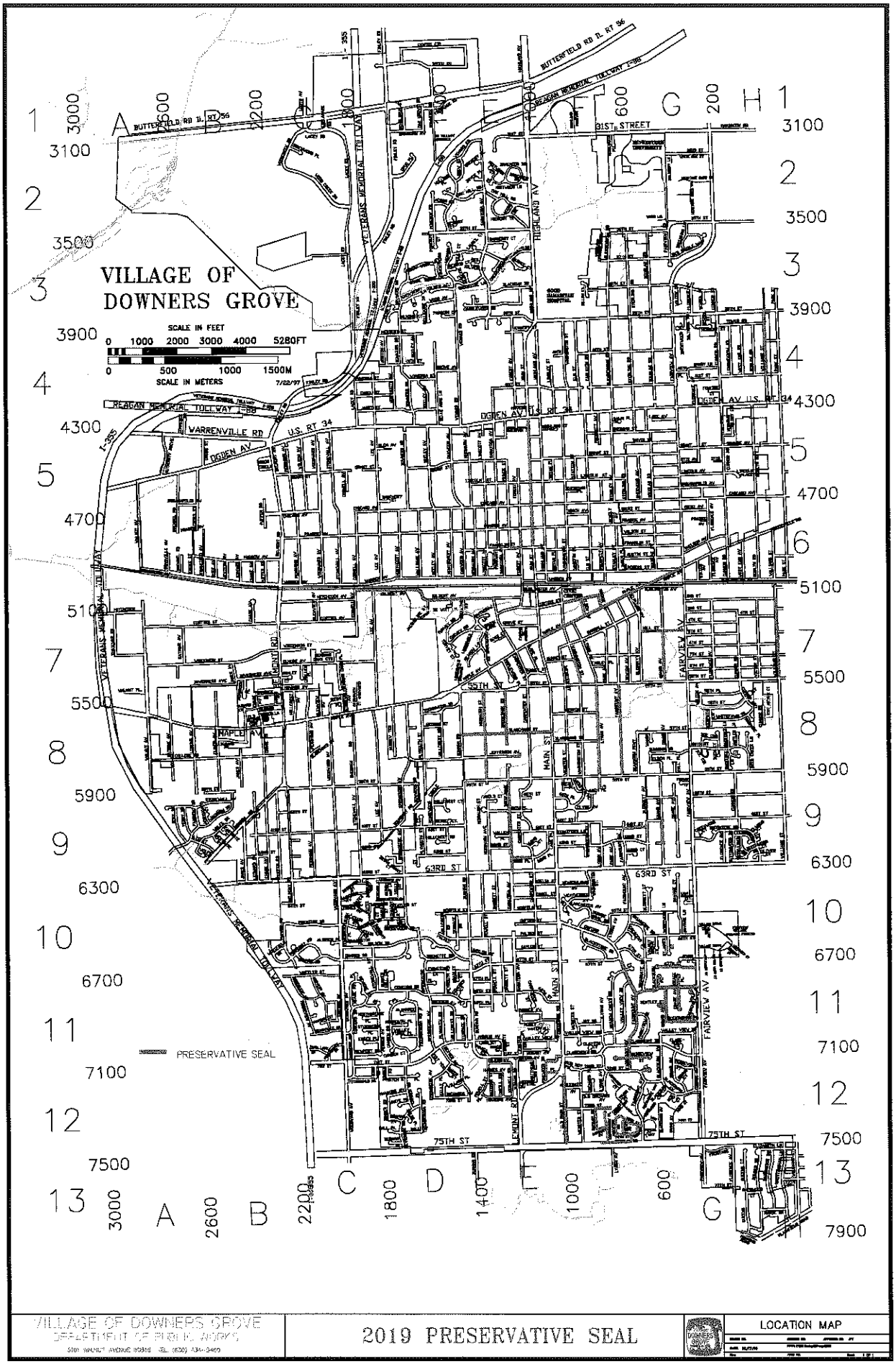
Year contribution made: _____ Amount: $ _____

_____ _____
Signature Print Name

BID SUBMITTAL CHECKLIST

Each Bidder's Bid Package must be submitted with all requisite forms properly completed, and all documentation included. The following list is not all-inclusive, but is designed to facilitate a good, competitive bidding environment.

1. ☑ Instructions to Bidders read and understood. Any questions must be asked according to the instructions.
2. ☑ Cover sheet filled-in
3. ☑ Bid Form copies filled-in. All copies must have original signatures and seals on them.
4. ☑ Bid Bond or cashier's check enclosed with bid package.
5. ☑ Schedule of Prices completed. Check your math!
6. ☑ Bidder Certifications signed and sealed.
7. ☑ Letter from Surety ensuring issuance of Performance and Labor Bonds.
8. ☑ Letter from Insurance Agent or Carrier ensuring issuance of required job coverage.
9. ☑ Municipal Reference List completed.
10. ☑ Vendor request form W-9 completed.
11. ☑ Affidavit (IDOT Form BC-57, or similar).
12. ☑ Bid package properly sealed and labeled before delivery. If sending by mail or messenger, enclose in a second outer envelope or container. Project plan sheets do not have to be included with the bid package.



VILLAGE OF DOWNERS GROVE
DEPARTMENT OF PUBLIC WORKS
5101 WALNUT AVENUE 60515 TEL (630) 434-5460

2019 PRESERVATIVE SEAL

LOCATION MAP

2019 ROADWAY MAINTENANCE PROGRAM
STREETS ESTIMATED FOR PRESERVATIVE SEAL

STREET	FROM	TO	LENGTH LF	AREA SY
61ST ST	FAIRMOUNT AVE	BLODGETT AVE	690	2147
62ND PL	BROOKBANK RD	CARPENTER ST	601	1870
67TH CT	FAIRVIEW	WEST END	1353	3082
68TH ST	FAIRMOUNT AVE	FAIRVIEW AVE	1832	6611
72ND CT	CUL DE SAC	72ND ST	315	1424
73RD ST	HARTFORD RD	FAIRMOUNT AVE	850	2644
73RD ST	BAYBURY RD	LYMAN AVE	470	1071
74TH ST	HARTFORD RD	YORK RD	425	1322
ASHBURY AVE	BAYBURY RD	CANTERBURY PL	310	964
BAYBURY RD	ASHBURY AVE	73RD ST	580	1804
BELDEN AVE	MAPLE AVE	CURTISS ST	470	1149
BENTLEY CT	GRAND AVE	W. END	208	865
BLACKBURN PL	N END	68TH ST	350	1445
BLANCHARD ST	DUNHAM RD	MAIN ST	2615	6173
BROOKBANK RD	BLANCHARD ST	55TH ST	1210	2622
BROOKBANK RD	BLANCHARD ST	JEFFERSON AVE	643	2000
BROOKBANK RD	63RD ST	59TH ST	2612	10385
BUCKINGHAM PL	GRAND	FAIRVIEW	940	3030
CANTERBURY PL	CUL DE SAC	ASHBURY AVE	431	1534
CANTERBURY PL	STOCKLEY RD	ASHBURY AVE	440	1369
CHURCHILL CT	BUCKINGHAM PL	N END	195	830
CLAREMONT DR	PINEWOOD	MAIN ST	748	2327
CURTISS ST	WASHINGTON ST	MACKIE PL	1058	3359
FAIRMOUNT AVE	59TH ST	55TH ST	2630	8182
FAIRMOUNT AVE	72ND ST	67TH ST	3369	10481
FOREST AVE	FRANKLIN ST	PRAIRIE AVE	540	1500
FRANKLIN ST	PRINCE ST	FOREST AVE	330	880
GILBERT AVE	CORNELL AVE	CARPENTER ST	4205	11102
GRAND AVE	55TH ST	HILL ST	1440	3840
GRAND AVE	62ND ST	61ST ST	640	1351
GRAND AVE	BENTLEY CT	68TH ST	485	1509
GRAND AVE	BUCKINGHAM PL	BENTLEY CT	480	1598
HARTFORD RD	74TH ST	73RD ST	470	1462
HILL ST	GRAND AVE	FAIRVIEW AVE	650	1806
JEFFERSON AVE	BROOKBANK RD	NELSON CT	330	1027
LYMAN AVE	CUL DE SAC	55TH ST	3076	7763
MACKIE PL	MAPLE AVE	CURTISS ST	331	846
MAIN ST	FRANKLIN ST	OGDEN AVE	3790	17668
MAIN ST	75TH ST	LEMONT RD	2023	10789
MAPLE AVE	MAIN ST	FAIRVIEW AVE	4441	14336
MIDDAUGH AVE	59TH ST	55TH ST	2537	6061
NELSON CT	JEFFERSON AVE	NORTH CUL DE SAC	175	594
OSAGE AVE	S END	68TH ST	650	2266
OSAGE PL	N END	68TH ST	337	1402
PINEWOOD DR	CLAREMONT DR	S END	418	1289
PINEWOOD DR	PINEWOOD DR N/S	LEMONT RD	345	997
RIDGEVIEW ST	CUL DE SAC W	CUL DE SAC E	1030	4047
STOCKLEY RD	W. END	74TH ST	1047	2958
TRENT RD	74TH ST	73RD ST	435	1353
WASHINGTON ST	55TH ST	SUMMIT ST	730	1987
WILLIAMS ST	41ST ST	39TH ST	1825	5678
WILLIAMS ST	55TH ST	SECOND ST	2600	6500
WOLF PL	CUL DE SAC	68TH ST	175	875
YORK RD	74TH ST	73RD ST	366	1139
		Total >	61,246	193,312
		Miles >	11.60	

Corrective Asphalt Materials

Mailing Address:
PO Box 87129
300 Daniel Boone Trail
South Roxana, IL 62087
Phone: 618-254-3855
Fax: 618-254-2200

Locations:
300 Daniel Boone Trail, South Roxana, IL 62087
43W630 Wheeler Road, Sugar Grove, IL 60554

June 27, 2019

STATEMENT OF EXPERENCE: JOB SUPERINTENDENT & DISTRIBUTOR DRIVER

WADE SPARKS –5 years of experience in the application of CRF & Reclamite using a distributor truck. Over 5 years of supervisory experience in the application of CRF & Reclamite.

1. I have never experienced any difficulty applying CRF or Reclamite to any Municipality roads.

2. I have never received any complaints regarding the quality of my work from any municipality.

EMERGENCY CONTACTS

Wade Sparks, Project Supervisor	Cell (630) 200-6463
Mike Sumrall, Operations Manager	Cell (630) 465-4142
Corrective Asphalt Materials, LLC	Office (618-254-3855
Marc Taillon, Vice President	Cell (314) 477-3995

Corrective Asphalt Materials

Mailing Address:
PO Box 87129
300 Daniel Boone Trail
South Roxana, IL 62087
Phone: 618-254-3855
Fax: 618-254-2200

Locations:
300 Daniel Boone Trail, South Roxana, IL 62087
43W630 Wheeler Road, Sugar Grove, IL 60554

June 27, 2019

STATEMENT OF EXPERENCE: JOB SUPERVISOR & DISTRIBUTOR DRIVER

JOHN HOLLERAN – I have over 26 years' experience in the application of CRF & Reclamite using a distributor truck. I also have over 18 years supervisory experience in the application of CRF & Reclamite.

1. I have never experienced any difficulty applying CRF or Reclamite to any Municipality roads.
2. I have never received any complaints regarding the quality of my work from any municipality.

EMERGENCY CONTACTS

John Holleran, Project Supervisor	Cell (630) 853-0832
Mike Sumrall, Operations Manager	Cell (630) 465-4142
Corrective Asphalt Materials, LLC	Office (618) 254-3855
Marc Taillon, Vice President	Cell (314) 477-3995

Illinois Department of Transportation
Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Affidavit of Availability

For the Letting of 7/2/2019
(Letting date)

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE**.

	1	2	3	4	5	
Contract Number	19052N	19047S	19041N	19061N	19008N	
Contract With	Barrington, IL	Bayport, MN	Carol Stream IL	Chemung Twp	Speedway Sand	
Estimated Completion Date	11/2019	07/2019	11/2019	07/2019	07/2019	
Total Contract Price	21,160.00	5,955.80	117,092.12	2,380.00	40,050.00	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	21,160.00	5,955.80	11,833.28	2,380.00		41,329.08
Uncompleted Dollar Value if Firm is the Subcontractor					21,395.39	21,395.39
				Total Value of All Work		62,724.47

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	NONE	NONE	NONE	NONE	NONE	0.00
Portland Cement Concrete Paving	NONE	NONE	NONE	NONE	NONE	0.00
HMA Plant Mix	NONE	NONE	NONE	NONE	NONE	0.00
HMA Paving	NONE	NONE	NONE	NONE	NONE	0.00
Clean & Seal Cracks/Joints	NONE	NONE	NONE	NONE	NONE	0.00
Aggregate Bases & Surfaces	NONE	NONE	NONE	NONE	NONE	0.00
Highway,R.R. and Waterway Structures	NONE	NONE	NONE	NONE	NONE	0.00
Drainage	NONE	NONE	NONE	NONE	NONE	0.00
Electrical	NONE	NONE	NONE	NONE	NONE	0.00
Cover and Seal Coats	NONE	NONE	NONE	NONE	NONE	0.00
Concrete Construction	NONE	NONE	NONE	NONE	NONE	0.00
Landscaping	NONE	NONE	NONE	NONE	NONE	0.00
Fencing	NONE	NONE	NONE	NONE	NONE	0.00
Guardrail	NONE	NONE	NONE	NONE	NONE	0.00
Painting	NONE	NONE	NONE	NONE	NONE	0.00
Signing	NONE	NONE	NONE	NONE	NONE	0.00
Cold Milling, Planning & Rotomilling	NONE	NONE	NONE	NONE	NONE	0.00
Demolition	NONE	NONE	NONE	NONE	NONE	0.00
Pavement Markings (Paint)	NONE	NONE	NONE	NONE	NONE	0.00
Other Construction (List)	NONE	NONE	NONE	NONE	NONE	0.00
Asphalt Rejuvenation	21,160.00	5,955.80	11,833.28	2,380.00	21,395.39	62,724.47
						0.00
Totals	21,160.00	5,955.80	11,833.28	2,380.00	21,395.39	62,724.47

Disclosure of this information is **REQUIRED** to accomplish the statutory purpose as outlined in the "Illinois Procurement Code". Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	1	2	3	4	5
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Illinois Department of Transportation
Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Affidavit of Availability

For the Letting of 7/2/2019
(Letting date)

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	6	7	8	9	10	
Contract Number	19016N	19009N	19010N	19011N	19053S	
Contract With	Kane County, IL	Vernon Hills, IL	Arlington Heights, IL	Lake in the Hills, IL	West Contracting	
Estimated Completion Date	08/2019	06/2019	05/2019	06/2019	09/2019	
Total Contract Price	845,095.75	18,344.00	133,650.00	52,416.00	18,962.52	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	648,214.40	18,344.00	133,650.00	52,416.00		893,953.48
Uncompleted Dollar Value if Firm is the Subcontractor					18,962.52	40,357.91
				Total Value of All Work		934,311.39

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	590,173.90	18,344.00	133,650.00	52,416.00	18,962.52	876,270.89
						0.00
Totals	590,173.90	18,344.00	133,650.00	52,416.00	18,962.52	876,270.89

Disclosure of this information is **REQUIRED** to accomplish the statutory purpose as outlined in the "Illinois Procurement Code". Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	6	7	8	9	10
Subcontractor	AC Pavement				
Type of Work	Cape Seal				
Subcontract Price	237,753.85				
Amount Uncompleted	237,753.85				
Subcontractor	S.K.C Construction				
Type of Work	Crack Seal				
Subcontract Price	26,460.00				
Amount Uncompleted	26,460.00				
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	264,213.85	0.00	0.00	0.00	0.00

Illinois Department of Transportation
Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Affidavit of Availability

For the Letting of 7/2/2019
(Letting date)

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Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	11	12	13	14	15	
Contract Number	19062S	19015N	19064N	19021N	19023N	
Contract With	Cole County, MO	Plote Construction	Evanston, IL	Winnetka, IL	McHenry, IL	
Estimated Completion Date	06/2019	07/2019	08/2019	06/2019	07/2019	
Total Contract Price	56,590.89	171,617.60	49,825.30	23,953.80	41,202.00	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	56,590.89		49,825.30	23,953.80	41,202.00	1,065,525.47
Uncompleted Dollar Value if Firm is the Subcontractor		171,617.60				211,975.51
				Total Value of All Work		1,277,500.98

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	56,590.89	171,617.60	49,825.30	23,953.80	41,202.00	1,219,460.48
						0.00
Totals	56,590.89	171,617.60	49,825.30	23,953.80	41,202.00	1,219,460.48

Disclosure of this information is **REQUIRED** to accomplish the statutory purpose as outlined in the "Illinois Procurement Code". Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	11	12	13	14	15
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Illinois Department of Transportation

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Affidavit of Availability

For the Letting of 7/2/2019
(Letting date)

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	16	17	18	19	20	
Contract Number	19024N	19049S	19058N	19066N	19054S	
Contract With	Lake County DOT	Franklin County, MO	Grafton Twp,IL	Highland Park, IL	Jokerst, Inc	
Estimated Completion Date	06/2019	07/2019	07/2019	07/2019	08/2019	
Total Contract Price	779,535.52	93,908.64	11,508.00	25,000.00	9,407.00	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	779,535.52	93,908.64	11,508.00	25,000.00		1,975,477.63
Uncompleted Dollar Value if Firm is the Subcontractor					9,407.00	221,382.51
				Total Value of All Work		2,196,860.14

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	779,535.52	93,908.64	11,508.00	25,000.00	9,407.00	2,138,819.64
						0.00
Totals	779,535.52	93,908.64	11,508.00	25,000.00	9,407.00	2,138,819.64

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Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	16	17	18	19	20
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	0.00	0.00	0.00	0.00	0.00

Illinois Department of Transportation

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Affidavit of Availability

For the Letting of 7/2/2019
(Letting date)

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	21	22	23	24	25	
Contract Number	19063S	19059N	19060N	19040S	19046N	
Contract With	Lakeland Shores, MN	Lisle Twp, IL	Martin & Co	Moberly, MO	Montgomery, IL	
Estimated Completion Date	07/2019	08/2019	09/2019	10/2019	07/2019	
Total Contract Price	1,045.80	36,740.00	3,834.00	45,422.93	71,724.40	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	1,045.80	36,740.00		45,422.93	71,724.40	2,130,410.76
Uncompleted Dollar Value if Firm is the Subcontractor			3,834.00			225,216.51
				Total Value of All Work		2,355,627.27

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	1,045.80	36,740.00	3,834.00	45,422.93	71,724.40	2,297,586.77
						0.00
Totals	1,045.80	36,740.00	3,834.00	45,422.93	71,724.40	2,297,586.77

Disclosure of this information is **REQUIRED** to accomplish the statutory purpose as outlined in the "Illinois Procurement Code". Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	21	22	23	24	25
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	0.00	0.00	0.00	0.00	0.00

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 7/2/2019

(Letting date)

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	26	27	28	29	30	
Contract Number	19065S	19042S	19056N	19057S	19055S	
Contract With	Richfield, MN	SIUE	St. Charles, IL	St. Charles, MO	St. Marys Point, MN	
Estimated Completion Date	07/2019	11/2019	07/2019	07/2019	07/2019	
Total Contract Price	436,580.00	56,525.00	64,087.12	37,310.00	4,512.42	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	436,580.00	12,495.00	64,087.12	37,310.00	4,512.42	2,685,395.30
Uncompleted Dollar Value if Firm is the Subcontractor						225,216.51
				Total Value of All Work		2,910,611.81

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	436,580.00	12,495.00	0.00	37,310.00	4,512.42	2,788,484.19
						0.00
Totals	436,580.00	12,495.00	0.00	37,310.00	4,512.42	2,788,484.19

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Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	26	27	28	29	30
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	0.00	0.00	0.00	0.00	0.00

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 7/2/2019

(Letting date)

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, Illinois 62764

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Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show **NONE.**

	31	32	33	34	35	
Contract Number	19035N	19051S	19029N	19067N	19050N	
Contract With	DeKalb County, IL	Woodbury, MN	Woodridge, IL	Elk Grove Village, IL	Property Specialists, Inc	
Estimated Completion Date	07/2019	07/2019	07/2019	08/2019	08/2019	
Total Contract Price	95,158.00	328,666.20	13,250.02	72,141.03	21,531.75	Accumulated Totals
Uncompleted Dollar Value if Firm is the Prime Contractor	95,158.00	328,666.20	13,250.02	72,141.03	21,531.75	3,216,142.30
Uncompleted Dollar Value if Firm is the Subcontractor						225,216.51
				Total Value of All Work		3,441,358.81

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work Subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

						Accumulated Totals
Earthwork	None	None	None	None	None	0.00
Portland Cement Concrete Paving	None	None	None	None	None	0.00
HMA Plant Mix	None	None	None	None	None	0.00
HMA Paving	None	None	None	None	None	0.00
Clean & Seal Cracks/Joints	None	None	None	None	None	0.00
Aggregate Bases & Surfaces	None	None	None	None	None	0.00
Highway,R.R. and Waterway Structures	None	None	None	None	None	0.00
Drainage	None	None	None	None	None	0.00
Electrical	None	None	None	None	None	0.00
Cover and Seal Coats	None	None	None	None	None	0.00
Concrete Construction	None	None	None	None	None	0.00
Landscaping	None	None	None	None	None	0.00
Fencing	None	None	None	None	None	0.00
Guardrail	None	None	None	None	None	0.00
Painting	None	None	None	None	None	0.00
Signing	None	None	None	None	None	0.00
Cold Milling, Planning & Rotomilling	None	None	None	None	None	0.00
Demolition	None	None	None	None	None	0.00
Pavement Markings (Paint)	None	None	None	None	None	0.00
Other Construction (List)	None	None	None	None	None	0.00
Asphalt Rejuvenation	95,158.00	328,666.20	0.00	72,141.03	21,531.75	3,305,981.17
Totals	95,158.00	328,666.20	0.00	72,141.03	21,531.75	3,305,981.17

Disclosure of this information is **REQUIRED** to accomplish the statutory purpose as outlined in the "Illinois Procurement Code". Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others

For each contract described in Part I, list all the work you have subcontracted to others.

	31	32	33	34	35
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
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Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted	0.00	0.00	0.00	0.00	0.00

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates

Subscribed and sworn to before me

this 25th day of June, 2019.

Type or Print Name Marc Taillon Member

Officer or Director Title

Signed

Notary Public-Kelli Leighanne Bornes

My commission expires: 7/11/2022

Company Corrective Asphalt Materials, LLC

Address 300 Daniel Boone Trail

South Roxana, IL 62087

(Notary Seal)

KELLI LEIGHANNE BORNES
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
July 11, 2022

USI Insurance Services
308 North 21st Street
St Louis, MO 63103
www.usi.com
Tel: 800.969.2399

June 25, 2019

Kelli L Bornes
Administrative Assistant
Corrective Asphalt Materials, LLC
P.O. Box 87129
300 Daniel Boone Trail
South Roxana, IL 62087

Re: Village of Downers Grove
Preservative and Restorative Seal for Asphalt Pavements (ST-004E

Dear Kelli,

After review of the insurance specifications, your insurance will comply with the Insurance Requirements outlined in 32.1 – 32.10

Thank you.

Sincerely,

USI Insurance Services, LLC

Karlie Mueller

Karlie Mueller
Account Manager

Document A310™ – 2010

Conforms with The American Institute of Architects AIA Document 310

Bid Bond

CONTRACTOR:
(Name, legal status and address)
Corrective Asphalt Materials, LLC

P.O. Box 87129
S. Roxana, IL 62087

SURETY:
(Name, legal status and principal place of business)
The Cincinnati Insurance Company
P.O. Box 145496
Cincinnati, OH 45250-5496

Mailing Address for Notices

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:
(Name, legal status and address)
Village of Downers Grove
5101 Walnut Avenue
Downers Grove, IL 60515

BOND AMOUNT: Five Percent of Amount Bid

PROJECT:
(Name, location or address, and Project number, if any)
Preservative and Restorative Seal for Asphalt Pavements Bid No. ST-004E

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 2nd day of July , 2019

Corrective Asphalt Materials, LLC
(Principal) *(Seal)*

Witness Leighanne Bowes
(Witness) Witness: Leighanne Bowes

marc Taillon, member
(Title)

Witness
(Witness)

The Cincinnati Insurance Company
(Surety) *(Seal)*

Brandi L. Bullock
(Title) Brandi L. Bullock, Attorney-in-Fact

THE CINCINNATI INSURANCE COMPANY

Fairfield, Ohio

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That THE CINCINNATI INSURANCE COMPANY, a corporation organized under the laws of the State of Ohio, and having its principal office in the City of Fairfield, Ohio, does hereby constitute and appoint

Michael T. Reedy; Stephen C. Ruff; Patricia A. Inchiostro; Gregory L. Stanley; Theresa A. Hunziker; Barbara M. Johnson; Christopher J. O'Hagan; Brandi L. Bullock; Don K. Ardolino; Kimberly Ann Connell; Timothy E. Griffin; Michael A. Flavin and/or Debra Baggett

of Chesterfield and St. Louis, Missouri its true and lawful Attorney(s)-in-Fact to sign, execute, seal and deliver on its behalf as Surety, and as its act and deed, any and all bonds, policies, undertakings, or other like instruments, as follows:

Any such obligations in the United States, up to
Fourty Million and No/100 Dolalrs ($40,000,000.00).

This appointment is made under and by authority of the following resolution passed by the Board of Directors of said Company at a meeting held in the principal office of the Company, a quorum being present and voting, on the 6th day of December, 1958, which resolution is still in effect:

"RESOLVED, that the President or any Vice President be hereby authorized, and empowered to appoint Attorneys-in-Fact of the Company to execute any and all bonds, policies, undertakings, or other like instruments on behalf of the Corporation, and may authorize any officer or any such Attorney-in-Fact to affix the corporate seal; and may with or without cause modify or revoke any such appointment or authority. Any such writings so executed by such Attorneys-in-Fact shall be binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 7th day of December, 1973.

"RESOLVED, that the signature of the President or a Vice President and the seal of the Company may be affixed by facsimile on any power of attorney granted, and the signature of the Secretary or Assistant Secretary and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power of certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certified by certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company."

IN WITNESS WHEREOF, THE CINCINNATI INSURANCE COMPANY has caused these presents to be sealed with its corporate seal, duly attested by its Vice President this 1st day of October, 2015.

The Cincinnati Insurance Company CORPORATE SEAL OHIO

THE CINCINNATI INSURANCE COMPANY

Stephen A. Jantz

Vice President

STATE OF OHIO)
) ss:
COUNTY OF BUTLER)

On this 1st day of October, 2015, before me came the above-named Vice President of THE CINCINNATI INSURANCE COMPANY, to me personally known to be the officer described herein, and acknowledged that the seal affixed to the preceding instrument is the corporate seal of said Company and the corporate seal and the signature of the officer were duly affixed and subscribed to said instrument by the authority and direction of said corporation.

NOTARIAL SEAL * STATE OF OHIO *

Mark J. Huller

MARK J. HULLER, Attorney at Law
NOTARY PUBLIC - STATE OF OHIO
My commission has no expiration date. Section 147.03 O.R.C.

I, the undersigned Secretary or Assistant Secretary of THE CINCINNATI INSURANCE COMPANY, hereby certify that the above is a true and correct copy of the Original Power of Attorney issued by said Company, and do hereby further certify that the said Power of Attorney is still in full force and effect.

GIVEN under my hand and seal of said Company at Fairfield, Ohio.
this 2nd day of July, 2019

The Cincinnati Insurance Company CORPORATE SEAL OHIO

Scott R Bolen

Secretary

BN-1005 (10/15)

J.D. Kutter

June 25, 2019

Village of Downers Grove
5101 Walnut St.
Downers Grove, IL 60515

RE: Corrective Asphalt Materials, LLC
Bid No. ST-004E – Preservative and Restorative Seal for Asphalt Pavements

To Whom It May Concern:

This is to confirm that we are currently providing bonds through Cincinnati Insurance Company and have established a bonding line of credit for Corrective Asphalt Materials, LLC in the approximate amount of $2,000,000 for single projects with a total aggregate program of $6,000,000.

If Corrective Asphalt Materials, LLC were to be awarded any projects under the captioned Proposal, we anticipate no problems in continuing this bonding capacity and are prepared to provide any needed Performance and Payment bonds requested by Corrective Asphalt Materials, LLC subject to its request and it continuing to meet the underwriting criteria of the bonding company.

Sincerely,

Don K. Ardolino

Affiliated with CRANE SINCE 1855
100 N. Broadway • Ste. 900 • St. Louis, MO 63102
Phone: 314-444-4949 • www.jdkutter.com

Robert E. Boyer

Asphalt Rejuvenators "Fact, or Fable"

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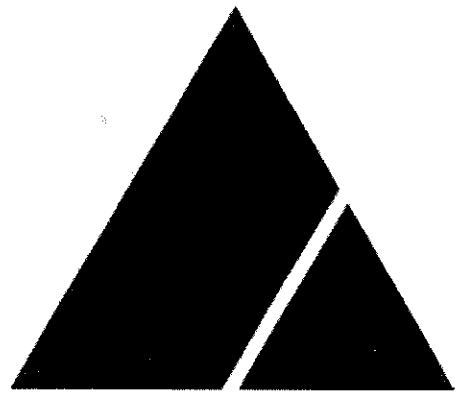
Senior District Engineer
Asphalt Institute



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Prepared for Presentation at the

Transportation Systems 2000 (TS2K) Workshop
San Antonio, Texas
February 28 – March 3, 2000

Robert E. Boyer

ASPHALT REJUVENATORS – "Fact, or Fable"

By: Robert E. Boyer. Ph.D., P.E.

There are numerous methods being employed for asphalt pavement preservation, including rejuvenator emulsions, asphalt emulsion fog seals, a variety of surface treatments (including slurry and micro surfacing technologies), and emerging asphalt thin overlay technologies. These methods range in cost from approximately $0.50 to $2.50 per square yard. To make the most of maintenance budgets, many agencies have resorted to the use of asphalt rejuvenators as an alternative to revive aging and brittle asphalt pavements. With the proven performance of asphalt rejuvenators to revive an aging pavement, the pavement engineer has an economical method to extend pavement life. This type asphalt pavement treatment has the potential to extend the life of an asphalt pavement for several years beyond the point where rehabilitation, or major reconstruction would normally be required; thus significantly decreasing the pavements annual maintenance costs.

The objective of this discussion is to establish criteria necessary to ascertain the performance of a rejuvenator; i.e., the material parameters and a method of measuring its performance. Subsequently, the results of research programs and construction projects are reviewed. Lastly, recommendations are advanced concerning the use of rejuvenators.

Robert E. Boyer

CRITERIA FOR A REJUVENATOR

Asphalt binders cannot be represented by a single chemical formula. The American Society of Testing and Materials (ASTM) defines it as "a dark brown to black cementitious material in which the predominating constituents are bitumens which occur in nature or are obtained in petroleum processing."

Asphalt binders are, however, fractionated into two subdivisions, i.e., asphaltenes and maltenes as depicted in Figure 1. Asphaltenes (A) are defined as that fraction of the asphalt insoluble in n-pentane. The function of the asphaltenes is to serve as a bodying agent. Maltenes is the collective name for the remainder of the asphalt material left after precipitation of the asphaltenes. Four principle bodies of maltenes have been identified and each has a specific function. These four bodies are:

- Polar compounds or Nitrogen bases (N) - components of highly reactive resins, which act as a peptizer for the asphaltenes.

- First acidiffins (A_1) - components of resinous hydrocarbons which function as a solvent for the peptized asphaltenes.

- Second acidiffins (A_2) - components of slightly unsaturated hydrocarbons that also serve as a solvent for the peptized asphaltenes.

- Saturated hydrocarbons or paraffins (P) – components of hydrocarbons, which function as a jelling agent for the asphalt components.

The cementing agent in an asphalt pavement, the asphalt binder (normally 4-7% by weight) represents the component that experiences premature hardening as a result of oxidation. Asphalt pavements, which are structurally sound, deteriorate as a result of oxidation and occasionally as a result or incorrect design or improper construction practice. The first phenomena, that of oxidation, is prevalent in all asphalt pavements, and is the subject addressed in this discussion.

In tests conducted by Rostler and White (1), it was reported that the "A" and "P" asphalt components were the most stable; and the "N", "A_1", and "A_2" components were more subject to oxidation in descending order, respectively. Consequently, during oxidation the "N" components convert to "A" components rapidly while the conversion process for the "A_1" and "A_2" components proceed at a slower rate. This process results in an increase in the "A" fraction of asphalt with time, and decreases the "N", "A_1", and "A_2" components. It was also reported the "the maltenes parameter $(N+A_1)/(P+A_2)$, the ratio of chemically more active to less reactive components present in the asphalt binder, is a measure of predictable durability."

During the process of weathering or oxidation, the ratio of maltenes to asphaltenes is reduced with the result being a dry and brittle pavement. Therefore, if a rejuvenator is to successfully resurrect an aged facility, it must be able to penetrate the pavement and to a

limited depth improve or restore the maltenes to asphaltenes balance. A reasonable measure of the ability of a rejuvenator to improve a pavement's durability can be had:

- By comparing the penetration at 25°C (77°F) of the asphalt binder extracted from untreated and treated cores.
- By comparing the viscosity at 60°C (140°F) of the asphalt binder extracted from untreated and treated cores.
- By comparing the percentage loss of aggregate when untreated and treated samples are subjected to a pellet abrasion test.

The latter two methods were employed by Rostler and White (1) in laboratory tests performed on prototype asphalt rejuvenators. The use of asphalt viscosity and penetration values has been incorporated into the contract specifications for Federal and Public Works rejuvenation contracts.

In summary, the criteria for a rejuvenator must involve two phenomena:

- First, the product must contain maltenes fractions of asphalt in order to improve and balance the maltenes to asphaltenes ratio.
- Secondly, a test method must be employed to measure improved durability of a pavement; e.g., an asphalt penetration, viscosity, or abrasion loss test.

TEST PROGRAMS

Billions of square yards of asphalt pavements make up more than 93 percent of the U.S. pavement infrastructure, and there is a growing interest to employ rejuvenators as an economic pavement preservation technique. Documentation regarding asphalt pavement rejuvenator practice and performance is needed to support Agency Pavement Preservation Programs. Several research efforts have been conducted in an effort to document application of the asphalt rejuvenators. They include:

- A study sponsored by the Air Force Weapons Laboratory, dated May 1970, entitled "Rejuvenation of Asphalt Pavement" (1) which consisted of a laboratory investigation of five products. The method of investigation entailed preparation of sand/asphalt briquettes composed of graded Ottawa sand, Portland cement and asphalt of specified penetration values. Test briquettes were subjected to equal application rates of five rejuvenator products, aged until one-half of the volatile constituents of the rejuvenating agent was lost, and subsequently, subjected to various tests, including permeability, depth of penetration, viscosity, and pellet abrasion. The conclusion of this study revealed that Reclamite and Koppers Bituminous Pavement Rejuvenator (BPR) performed as asphalt rejuvenators in that the viscosity of the asphalt binder was improved and the loss of aggregate from the pellet abrasion test was substantially reduced by application of both products. This conclusion was based on comparisons with untreated control samples and the other products.

- Technical Report R690 (2), dated August 1970, sponsored by the Naval Facilities Engineering Command and conducted by the Naval Civil Engineering Laboratory at Port Hueneme, California, which consisted of a study of the claims of the proprietary product called Reclamite. The report approached the subject in a neutral manner and balanced the claims of the manufacturer against actual field use by several agencies, including several Federal users, the California State Division of Highways and several city and county governments. The conclusion was that the manufacturer's claims for the performance of Reclamite were essentially correct and no further investigations were required to determine the effectiveness of the product.

- Evaluation of Reclamite by the U.S. Navy as reported in their publication "Value Engineering," dated August 1973 (3). This report concerned the application of Reclamite on three roads at the Naval Weapons Center, China Lake, California. The project involved treating the three roads with Reclamite and retaining an untreated test section at each test site. At periodic intervals, judgements, photographs, and core samples for asphalt penetration measurements were taken to assess the effectiveness of the product. The test covered a period of almost two years. The conclusion of this evaluation revealed that field tests and laboratory reports "show conclusively that Reclamite does prolong the life of asphalt concrete pavements."

- A study, sponsored by the Air Force Civil Engineering Center and accomplished by the U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg,

Mississippi, February 1976 (4), involved treating adjacent pavement areas at three Air Force bases with four proprietary rejuvenator products and an asphalt emulsion seal. The tests were conducted at a base in the dry, hot southwestern part of the United States, a base in the humid, hot southeastern part of the country, and a third base located in the cold north-central part of the country. The study covered a period of four years and reached the conclusion that Koppers BPR, Reclamite, and Petroset do rejuvenate the old asphalt binder while Gilsabind and SS-1 Asphalt Emulsion have a hardening effect. Other conclusions were reported, including an indication that the viscosity of treated asphalt is a better indicator of the rejuvenating effect of the materials tested than was the penetration test. There have been no comprehensive independent tests comparing the performance of asphalt rejuvenators since this study was completed (6). Since 1995, at least two rejuvenator products have been introduced into the market; however, the FAA continues to rely on the data presented in the Air Force study.

CASE EXPERIENCE

Asphalt rejuvenators have been used extensively by Federal, State, County an Municipal Agencies over the past 15 years, and predicated on past performance results, it is noted that there are clear-cut opinions regarding success of a rejuvenator product. Once a rejuvenator product has been used, a pavement engineer's opinion appears to be that the project was either totally successful, or completely ineffective. It is hypothesized that these diverse

attitudes stem from proper and improper application of a product, rather than the performance of a product itself.

As rejuvenators increase in popularity, proprietary specifications are being given widespread use. Initially, this situation did not create any major problems, as the manufacture of rejuvenators was regional with competitive products separated by the distance across the United States. Typical examples of projects accomplished under method type specifications were US395, North of Carson City, Nevada, which was treated with Reclamite at a rate of .12 gallons per square yard in 1965, and an airfield pavement at Wright-Patterson AFB, Ohio, treated with Koppers BP at a rate of .15 gallons per square yard in 1972. As use of the products increased and competition intensified, proprietary specifications were challenged. Specifications were then written to permit competitive products. A specified rate was included in the contractual documents. This practice is common in current specifications. However, the rejuvenator products perform differently among themselves in a given environment, and differently within themselves in changing environments. Therefore, a given application rate, in most projects, does not insure a desired end product. In a project at Kincheloe AFB, Michigan, in the summer of 1974, a performance specification was used. The specification called for a 30 percent increase in the penetration of the asphalt in the top 1/4 inch of the pavement 60 days subsequent to application. Cores were required prior to treatment and 60 days subsequent to application. The contractor used Reclamite and achieved an average increase in the asphalt penetration of approximately 120 percent.

Further restrictions are suggested to govern application rates to avoid unacceptable anti-skid, softness and/or performance characteristics. These were:

"The contractor shall be responsible for conducting preliminary testing to determine the proper application rate for the rejuvenator so as to achieve the required end results specified above. This shall be accomplished without causing the pavement to become unstable to 90 degree turns of an automobile at 5 MPH, or exhibit more than a 25 percent loss in measured friction resistance values at 12 hour periods subsequent to application of the rejuvenator," and

"Should the required increase in penetration value not be achieved, additional applications of the rejuvenator and mineral aggregate shall be made at application rates not to exceed 50 percent of the initial application rate. Retreatment and retesting shall be at the expense of the contractor. The Contracting Officer shall hold the contractor's performance bond in full force and effect until final test data indicates the work was completed in accordance with the specifications."

A contract was awarded in June 1976. The rejuvenator product Reclamite was used and the contract was accomplished and successfully completed with the above specification requirements in November 1976. This was the first documented case of using a rejuvenator emulsion performance specification on an asphalt pavement. Satisfactory performance guidelines or targets should be based on the capability of the material to decrease the viscosity and increase the penetration value of the asphalt binder. In the case of asphalt pavements less than 2 years old, the viscosity shall be reduced by a minimum of 20 percent and the penetration shall be increased by a minimum of 10 percent. For asphalt

pavements more that 2 years old, the viscosity shall be reduced by a minimum of 40 percent and the penetration value shall be increased by a minimum of 20 percent. Testing shall be performed on recovered asphalt binder from the pavement to a depth of three-eighths (3/8") inch. Standard ASTM Test methods to measure the viscosity @ 60°C (140°F) and penetration @ 25°C (77°F) on the recovered asphalt binder should be specified. Treated test cores will be extracted no sooner than 60 days following rejuvenation of pavement, or as approved by the Contracting Agency.

USING REJUVENATORS - GUIDE

All rejuvenators are applied in the same way--by spraying the chemical onto the pavement surface with an asphalt distributor. However, from this point the procedures vary because of the different products and because of the different end results desired. Discussion of the use of rejuvenators can be considered in three separate categories; new construction, maintenance, and re-construction.

Using a rejuvenator on new construction does not seem to be logical at first glance. However, it has been established that the greatest change in composition of an asphalt binder takes place during the manufacture of the hot mix asphalt (HMA). Applying a rejuvenator to a new surface a few weeks after it has been laid does several things to the pavement. Besides restoring the original asphalt properties that were lost in the HMA manufacture, the chemical assists in sealing the pavement as well as in improving the durability of the surface course.

Maintenance can be subdivided into preventive and corrective maintenance. Preventive maintenance should be applied to pavements at the first signs of aging of the surface course, pitting, raveling, shrinkage, and cracking. Some pavement experts maintain that preventive maintenance should begin before any of these described signs occur. However, to do this, there must be a certain amount of clairvoyance involved in determining the right time before these conditions show up. Starting a maintenance program too early can become a costly item. Nonetheless, applying the rejuvenator at periodic intervals can restore the asphaltene-maltene balance so essential to maintain a ductile, pliable pavement. This type of preventive maintenance is particularly applicable to pavements in the hot, dry southwestern section of the country.

Corrective maintenance involves reworking and salvaging existing road mixes. Using a rejuvenator in this type of maintenance can facilitate scarifying and mixing. It will aid in replasticizing old asphalt and improve its durability. This form of maintenance should be considered when the road mix surface appears weathered and crusted and cannot be restored by applying only a rejuvenator.

The third category of rejuvenator use is that of re-construction. This involves more than applying a rejuvenator emulsion onto the surface and rolling the treated pavement. Work in the category is undertaken when the pavement has outlived its life; when preventive maintenance has failed to stop the pavement deterioration; or when a HMA overlay is to be placed over the existing pavement. The overlayment may be due to a need for increased

structural strength, or it may be necessitated by failure of the old surface to respond to normal maintenance.

If the existing pavement possesses good structural qualities and the overlay is being placed to increase its strength, a rejuvenator can be applied to the old surface several days before the overlay is constructed. This application will cause the existing surface to soften, regain some of its original ductility, and will promote a good bond between the old and new surfaces.

Where the existing surface has progressed to a condition where cracking, pitting, and raveling has occurred, and it is feared that these structural deformations will reflect through the new pavement, different procedures are being advanced. Cracks as much as two inches deep in the airfield pavements at the civilian airport at Augusta, Georgia were repaired by a treatment with Koppers BPR and a lengthy follow-on program of constant rolling (5). Reclamite, on the other hand, has had excellent success with heater planing and heater mixing of old pavements. One of the most successful projects of this nature was completed at the El Paso International Airport. The heater-planer process involves heating the surface of the existing pavement with a traveling infrared heat source. Once the old asphalt is heated, it becomes very pliable for a short period of time. During this time of pliability, a sharp blade following the application of heat peels off the oxidized or deteriorated asphalt to the desired depth. The applicator truck follows immediately behind the heater-planer. Once the old asphalt is removed, the process is similar to that described previously, i.e., the rejuvenator helps to rejuvenate the old surface and promotes a good bond between the old

and new pavements. The heater-scarified method is very much like the heater-planer method. The difference is that instead of planing off the old surface, the pavement is scarified to the desired depth, usually less than an inch, then treated with the rejuvenator. The new asphalt, if an overlay is to follow, is laid directly over the treated and scarified material. The thickness of the overlay lift may be as small as three-fourths to one inch.

An advantage of the heater-planer or heater-scarified method is readily evident when one considers grades and drainage when several overlays are applied to city streets. By continuing to use the existing material, restoring and balancing the asphaltene-maltene ratio through rejuvenators, expensive hot mix is no longer needed and design drainage elevations between curbs can be maintained for longer periods.

RECOMMENDATIONS

- Rejuvenators should be applied before raveling and other serious deterioration begins. A final conclusion reached is that problems may be experience with of improper rates
- The Using Agency should adopt a performance type specification.
- Develop a periodic maintenance program using rejuvenators in three to five year cycles will extend the life of existing pavements.
- The secret to proper rejuvenation application procedures is CAUTION. It is better to apply two or more low-rate applications of the emulsion to achieve the proper rate of application than to make only on pass and have it be too heavy. The

project engineer must be wary of areas that might contain free oil, grease, petroleum, or asphalt when applying the chemical. The engineer must also take care not to apply the rejuvenator to a densely graded pavement or to a surface that has been treated in a manner that will prevent penetration by the rejuvenator.

CONCLUSIONS

An asphalt rejuvenator emulsion offers three beneficial reactions:

- Increases penetration values and lowers the viscosity of the asphalt binder in the top portion of the pavement, which extends the pavement's life cycle.
- Seals the pavement against intrusion of air and water, thereby slowing oxidation, preventing stripping and raveling and protects the pavement in-depth.
- Increases the durability of the asphalt binder in the top portion of the pavement by improving the balance of chemical fractions of the asphalt binder.

As in most engineering projects, the project specifications are as important as the project design. The specifications should require a given measure of results rather than payment for quantity of emulsion. The reason for using a rejuvenator is to improve or restore the viscous properties of the asphalt; therefore, requiring the rejuvenator to achieve a given measure of standard penetration or measure of viscosity will insure a more satisfactory result than simply specifying a given rate of application.

REFERENCES

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2. Technical Report R690, Reclamite as a life Extender for Asphalt concrete pavements, Navy Facilities Engineering Command, Port Hueneme, California - August 1970.

3. Value Engineering, Report on Reclamite Usage, Naval Weapons Center, China Lake, California, Navy Facilities Engineering Command - Western Division, San Bruno, California 94066 - August 1973.

4. AFCEC-TR-76-3, Evaluation of rejuvenators for Bituminous Pavements, Air Force Civil Engineering Center, Tyndall Air Force Base, Florida 32401 - February 1976.

5. McGovern, E. W., Resume of Five Field Applications of Bituminous Pavement Rejuvenator, Unpublished Report, Koppers Company, Inc., Verona, Pennsylvania - July 10, 1963.

6. GAO/DRED-97-50R, Airfield Pavements : Use of Sealer/Rejuvenators to Extend Life of Airfields, United States General Accounting Office, Washington D.C. 20548 – February 27, 1997.

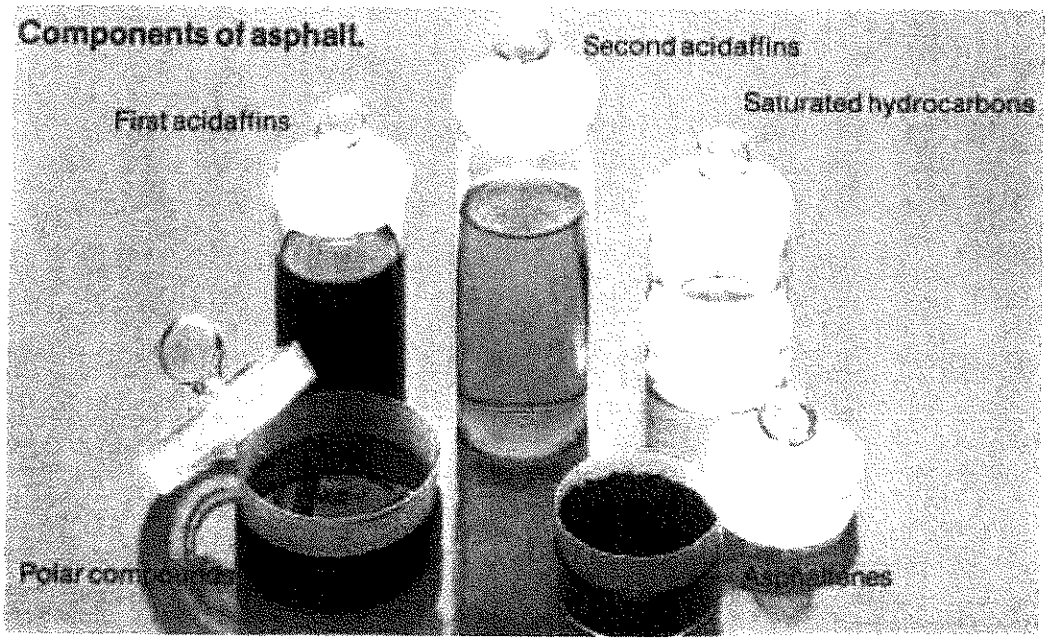

Figure 1. Asphalt Binder Fractions, Asphaltenes and Maltenes.

Corrective Asphalt Materials

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Test Sections

- Columbia, MO test section – 6 years after treatment
- Moberly, MO test section – over 5 years after treatment
- Kansas City, MO test section – 10 years after treatment

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

November 3, 1997
File No. 97-6327A

City of Orlando
Engineering/Streets and Drainage Bureau
Public Works Department
400 South Orange Avenue
Orlando, Florida 32801-3302

Attention: Mr. Rick Howard, P.E., City Engineer

Subject: Report of Phase II Pavement Rejuvenation Study
Various City Streets
Orlando, Florida

Gentlemen:

As requested and authorized, Ardaman & Associates, Inc. has completed engineering and testing services for Phase II of this pavement rejuvenation study. Phase I of this project included obtaining pavement samples prior to treatment with the rejuvenating agent and developing this testing program to evaluate the rejuvenating agent and provide data to assess the application period.

BACKGROUND

The City has been treating low volume streets with Reclamite®[1] asphalt rejuvenating agent for about 10 years. An initial application is typically made within one year after placement of the asphaltic concrete for an overlay. Reapplication is scheduled at a period of about 6 years. The intent of this program is to reverse the effects of "aging" (sometimes referred to as weathering or oxidation) by reintroducing portions of the asphaltic cement lost as a result of weathering. With aging, oxidation occurs and, in effect, reduces the petrolenes fraction[2] of the asphaltic cement. Increasing the petrolenes fraction improves the ductility of the asphaltic cement and therefore pavement durability.

Specifications developed for pavement rejuvenators and prior testing by others have concentrated on verifying that the rejuvenating products decrease the viscosity (or increase the penetration) of the asphaltic cement. Viscosity is measured on asphaltic cement extracted from cores obtained prior to treatment and after treatment with a rejuvenating agent. There is not much information available regarding critical values of viscosity, penetration or ductility that would indicate when the pavement is likely to develop cracks. SHRP-A-369 indicates that, in previous studies, penetration

[1] Manufactured by Golden Bear Division, Witco Corporation, P.O. Box 456, Chandler, AZ 85244. Supplied by Pavement Technology, Inc., Westlake, OH.

[2] Asphalt consists of four basic components: asphaltenes (A), Polar aromatics (PA), napthene aromatics (NA) and saturates(S). The latter three components, PA, NA and S are referred to as the petrolenes fractions. Asphaltenes are soluble only in the presence of polar and napthene aromatics, which act as media to disperse the dissolved asphaltenes. The saturates develop the setting characteristics of the entire solution.

less than 10 and ductility less than 20, measured at 25°C, were established to be the limits at which pavements start to show cracking.

TESTING PROGRAM

This study included field sampling and laboratory testing. The field sampling was performed in two phases. In Phase I, initial field samples were obtained from eight city streets[3] in mid-February 1997 prior to application of the rejuvenating agent in July/August 1997. The sample locations are presented in our report dated May 30, 1997, which is included in Appendix I. Four of the streets were selected for continued testing in Phase II. Additional samples were collected from locations near the pretreatment cores for each street after application of the rejuvenating agent. Testing to measure rheological properties was performed by PRI Asphalt Technologies, Inc. of Tampa, Florida, as a subconsultant to Ardaman, on the following samples:

Phase IIA:

- pretreatment core samples obtained in Phase I ;
- post treatment core samples obtained to compare with pretreatment conditions;

Phase IIB:

- virgin asphaltic cement from a local distributor; and
- asphaltic cement from a local distributor treated with Reclamite.

Dynamic shear and stiffness testing was performed on samples of these materials before and after artificial aging for 5 time intervals based on procedures and performance graded asphalt binder specifications established by the Strategic Highway Research Program (SHRP) as part of the Superpave™ (*Superior Performing Asphalt Pavements*) system. The testing program and procedures are further described in the following subsections.

Superpave™ Specification

This project used the Superpave specification as a basis for evaluating the performance of asphalt binder with and without rejuvenating agent, subjected to various degrees of field and laboratory-simulated aging. The following brief discussion explains the concepts of the Superpave system. The Asphalt Institute Publication No. SP-1, SUPERPAVE Performance Graded Asphalt Binder Specification and Testing, is a concise readable document which we recommend as a reference for more details regarding Superpave.

The Superpave specification addresses the following aspects of binder performance with the corresponding testing procedures listed:

Handling/Pumping — Rotational Viscometer
Permanent Deformation and Fatigue Cracking — Dynamic Shear Rheometer
Thermal Cracking — Bending Beam Rheometer or Direct Tension Tester.

The Superpave system uses new parameters such as the complex shear modulus and the phase angle between stress and strain in place of viscosity and penetration. The complex shear modulus,

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[3]Per the City, the streets that we studied were generally resurfaced in 1990. Reclamite was applied in 1991 and again in 1997.

G^*, is the ratio of total shear stress ($\tau_{max} - \tau_{min}$) to total shear strain ($\gamma_{max} - \gamma_{min}$). The time lag between stress and strain is related to the phase angle, δ. For a perfectly elastic material, an applied load causes an immediate response; thus the phase angle is zero. For a viscous material (such as asphalt at mixing temperatures) the phase angle approaches 90° Asphalt binders are viscoelastic at normal pavement temperatures and behave somewhere between these two extremes. For a more detailed explanation of these parameters refer to SP-1.

The Superpave binder specification tests asphalt binders in conditions that simulate the three critical stages during the binder's life:

- transport, storage and handling
- mix production and construction
- long-term aging.

Only long-term aging-related parameters are relevant for this project.

The original binder material represents the condition during transport, storage and handling. The Rolling Thin Film Oven (RTFO) test simulates mixing and placement of asphalt binder. The Pressure Aging Vessel (PAV) procedure simulates long-term in-service aging. The standard PAV 20-hour exposure corresponds to 5 to 10 years of field aging. This relationship is approximate and there are many contributing factors that make it difficult to reliably extrapolate for the field equivalency of greater or lesser PAV exposure times.

An excerpt from Table 1 of SP-1, provided as Exhibit 1, shows the performance graded asphalt binder specification. The performance grade (PG) evaluated for Orlando is PG 64-22. The 64 (°C) corresponds to the maximum pavement design temperature and the -22 (°C) corresponds to the minimum pavement design temperature. One important distinction between currently-used asphalt specifications and the Superpave specification is that the required physical properties remain constant for all of the performance grades. However, the temperatures at which these properties must be reached vary depending on the climate in which the binder is expected to be used. The applicable temperatures for Orlando are shaded.

City of Orlando - Public Works Department
File No. 97-6327A

EXHIBIT 1

Table 1. Performance Graded Asphalt Binder Specification

Performance Grade	PG 46			PG 52							PG 58					PG 64					
	-34	-40	-46	-10	-16	-22	-28	-34	-40	-46	-16	-22	-28	-34	-40	-10	-16	-22	-28	-34	-40
Average 7-day Maximum Pavement Design Temperature, °C [a]	<46			<52							<58					<64					
Minimum Pavement Design Temperature, °C [a]	>-34	>-40	>-46	>-10	>-16	>-22	>-28	>-34	>-40	>-46	>-16	>-22	>-28	>-34	>-40	>-10	>-16	>-22	>-28	>-34	>-40
Original Binder																					
Flash Point Temp, T48: Minimum °C	230																				
Viscosity, ASTM D 4402: [b] Maximum, 3 Pa•s (3000 cP), Test Temp, °C	135																				
Dynamic Shear, TP5: [c] G*/sin δ, Minimum, 1.00 kPa Test Temperature @ 10 rad/sec, °C	46			52							58					64					
Rolling Thin Film Oven (T 240) or Thin Film Oven (T 179) Residue																					
Mass Loss, Maximum, %	1.00																				
Dynamic Shear, TP5: G*/sin δ, Minimum, 2.20 kPa Test Temp @ 10 rad/sec, °C	46			52							58					64					
Pressure Aging Vessel Residue (PP1)																					
PAV Aging Temperature, °C [d]	90			90							100					100					
Dynamic Shear, TP5: G*/sin δ, Maximum, 5000 kPa Test Temp @ 10 rad/sec, °C	10	7	4	25	22	19	16	13	10	7	25	22	19	16	13	31	28	25	22	19	16
Physical Hardening [e]	Report																				
Creep Stiffness, TP1 [f] S, Maximum, 300 MPa m-value, Minimum, 0.300 Test Temp, @ 60 sec, °C	-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30
Direct Tension, TP3: [f] Failure Strain, Minimum, 1.0% Test Temp @ 1.0 mm/min, °C	-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30

Notes:

a. Pavement temperatures can be estimated from air temperatures using an algorithm contained in the Superpave™ software program or may be provided by the specifying agency, or by following the procedures as outlined in PP6.

b. This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

c. For quality control of unmodified asphalt cement production, measurement of the viscosity of the original asphalt cement may be substituted for dynamic shear measurements of G*/sin δ at test temperatures where the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary or rotational viscometer (AASHTO T 201 or T 202).

d. The PAV aging temperature is based on simulated climatic conditions and is one of three temperatures 90°C, 100°C or 110°C. The PAV aging temperature is 100°C for PG 64 and above, except in desert climates, where it is 110°C.

e. Physical Hardening – TP 1 is performed on a set of asphalt beams according to Section 13.1 of TP 1, except the conditioning time is extended to 24 hrs ± 10 minutes at 10°C above the minimum performance temperature. The 24-hour stiffness and m-value are reported for information purposes only.

f. If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.

The testing program is further described in the following subsections.

Phase IIA: Core Testing

Pretreatment Core Samples

We tested four of the 16 core samples obtained in Phase I of this study to measure the viscosity of the asphaltic concrete. The samples were selected from sunny and shaded locations both from the wheel path and outside the wheel path. The following table describes the test sample locations:

Test Sample Location	Wheel Path	Outside Wheel Path
Sunny	Ross Place (NW,RP,W1 and W2*)	Lucerne Terrace (SW,LT,C1 and C2*)
Shaded	Church Street (NE,CS,W1 and W2*)	Mack Avenue (SW,MA,C1 and C2*)

* Samples obtained as reserves.

The testing involved trimming the top ¼- to ½-inch of the cores and extracting the asphaltic cement using toluene and Rotavapor distillation (ASTM D5404-93). The extracted asphaltic cement was then subjected to testing. The rheological properties were measured using a Dynamic Shear Rheometer (DSR) under three different conditions where the shear rate and temperature were varied. Two of the tests measured viscosity at a temperature of 25°C using the DSR in sliding plate viscometer mode. One test was performed with a shear rate of 0.05 reciprocal seconds (1/sec) and a second with a shear rate of 0.001 (1/sec). The third test was performed at a temperature of 64°C with a shear rate of 10 radians/sec using the Superpave DSR protocol (AASHTO TP5) for binder. The testing was performed from July 23-30, 1997.

Post Treatment Core Samples

We obtained three additional cores from each of the selected streets on which pretreatment testing was performed adjacent to the locations where cores were previously obtained. They are referenced as follows:

Test Sample Location	Wheel Path	Outside Wheel Path
Sunny	Ross Place (NW,RP,W3, W4* and W5*)	Lucerne Terrace (SW,LT,C3, C4* and C5*)
Shaded	Church Street (NE,CS,W3, W4* and W5*)	Mack Avenue (SW,MA,C3, C4* and C5*)

* Samples obtained as reserves.

Again the cores were trimmed to obtain the top ¼- to ½-inch of material. The asphaltic cement was extracted and distilled as described above. The extracted asphaltic cement was subjected to testing as described above for the pretreatment samples.

Phase IIB: Asphalt Cement Testing

Virgin (neat) asphalt cement (AC-30) was obtained from an asphaltic cement producer and was tested both with and without the rejuvenating agent Reclamite.

Virgin Asphaltic Cement

It should be recognized that different sources of asphaltic cement may have different aging characteristics. We therefore attempted to obtain asphaltic cement used in past City of Orlando resurfacing projects. The asphaltic cement was obtained from a local distributor, Marathon Oil Company, Tampa, Florida, which has provided asphaltic cement for many of the City's resurfacing projects.

Samples of this asphaltic cement were subjected to artificial aging using the RTFO Procedure (AASHTO T240 or ASTM D 2872) followed by the AASHTO PP1 protocol in a Pressure Aging Vessel (PAV). A 20-hour time of exposure in the PAV is used to simulate 5 to 10 years of aging. For this testing, we obtained samples after 10, 15, 20, 25, and 30 hours of exposure in the PAV. Samples from each of the exposure time increments were subjected to dynamic shear and bending beam rheometer (BBR) stiffness testing (AASHTO TP1) to measure rheologic properties.

Treated Asphaltic Cement

The asphalt cement was treated with Reclamite at a ratio corresponding to the manufacturer's recommended application rate—0.06 gallons per square yard or 0.153 parts Reclamite emulsion[4] to 1 part AC. Treated asphalt was also tested at a much higher application rate of rejuvenating agent—0.35 parts Reclamite concentrate to 1 part AC, which is equivalent to 1.05 parts Reclamite emulsion to 1 part AC—to test whether high dosage had undesirable effects on pavement properties. Table 1 provides the calculations for the ratios of Reclamite to asphalt cement used in the testing. The testing procedures (including aging) performed for the virgin AC were repeated for the treated samples.

RESULTS

One purpose of this project was to identify test procedures that would effectively identify the appropriate time intervals and dosage for the City to apply rejuvenating agent. In order for this approach to work the specification parameter must

(i) approach a limit signaling impending cracking at some level of (simulated) aging;
(ii) be susceptible to improvement with the rejuvenating agent.

The specification parameters/tests for in-place binder in the first column of Exhibit 1 represent potentially useful indicators.

Phase IIA: Core Testing

Viscosity

The results of viscosity testing are presented in Table 2 and Figure 1. Testing data are included in Appendix II. For the centerline (C) samples, the viscosity decreases an average of 45 percent between pretreatment and post treatment. For the traffic area/wheelpath (W) samples, the

[4]Reclamite is recommended to be diluted 1 part concentrate to 2 parts water.

viscosity decreases an average of 3 percent. However, the Church Street sample tested at a shear rate of 0.001 (1/sec), shows a 78 percent decrease in viscosity. Without this result there appears to be little change in viscosity for the samples obtained from the wheelpath.

Superpave Binder Specification

The results of DSR testing are presented in Table 2 and Figure 2. Testing data are included in Appendix II. G*/sin δ decreases an average of 37 percent between pretreatment and post treatment for the centerline samples and increases an average of 11 percent for the wheelpath samples. All of the measured values are comfortably above the Superpave specification of 2.20 kPa, with or without treatment.

Rheological analysis of extracted and recovered asphalts provided the following results:

Centerline asphalt samples (C's) exhibited reduced binder viscosity and complex shear modulus (G*) with the Reclamite treatment. Centerline binder viscosities are higher than traffic lane binder viscosities. This observation is attributed to the stearic hardening (molecular structuring) that is allowed to occur in the non-traffic areas of the pavement. Traffic areas, on the other hand, are stressed by vehicular loads, "working" the binder and aggregate, which retards the molecular structuring (a reversible phenomenon). The stearic hardening hypothesis may explain why pavements first exhibit distress/cracking in the non-traffic areas.

Extracted and recovered asphalt from the traffic areas (W's), exhibit similar rheological properties with or without the Reclamite treatment. It is hypothesized that the binder and Reclamite blend together by different modes in the traffic and non-traffic areas. Additionally, the traffic areas constantly "work" the treated binder, which may influence:

- the compatibility of the asphalt and Reclamite;
- susceptibility to hydraulic actions of rain water;
- the relative permeability of the pavement.

Penetration of the Reclamite is probably higher in the non-traffic areas relative to the traffic paths. In addition, the rate of penetration reportedly decreases with successive applications of Reclamite. This is the second time that the pavements in this study have been treated.

Additional testing may better explain the differences observed between the centerline and traffic areas.

Phase IIB: Asphalt Cement Testing

The results of testing are presented in Table 3 and Figures 3, 4 and 5. Testing data are included in Appendix II. The dynamic shear rheology (DSR) has been expressed in kPa @ 64°C (147.2°F) as a function of G*/sin δ, which defines an asphalt's stiffness at a frequency equivalent to vehicular traffic. Since asphalt is a non-Newtonian thermoplastic material (more fluid at high temperature, and brittle at cold temperature), rheological measurements such as G*/sin δ provide information on the asphalt's ability to withstand stresses induced by vehicular traffic and/or climate conditions, while the creep stiffness measured assesses the material's flexibility/pliability at cold service temperatures, after aging, when it is in its most brittle state.

If an asphalt is too fluid at the high service temperatures, it may deform by rutting. If it is too stiff at cold temperatures, it will crack when stresses are induced. Therefore, the asphalt binder must possess a combination of properties to provide a long and successful service life.

Dynamic Shear Rheometer

Reclamite reduced the complex modulus of the treated asphalt binder. The degree of complex modulus reduction is dosage-dependent, see Table 3. The virgin AC-30 sample without aging is fairly close to the minimum specification value of 1.00 kPa and is actually lower than the 2.20 kPA required after the sample has been subjected to the Rolling Thin Film Oven procedure. Otherwise, the untreated binder is comfortably above the specification value after aging. The sample treated with Reclamite at the manufacturer's recommended amount is near the specified minimum without aging. This would indicate that the Reclamite should not be added to this unaged asphalt cement.

The high dosage Reclamite samples fail to meet the specification criteria even after aging, which would indicate that this amount of rejuvenating agent is excessive.

Reclamite tended to reduce the rate of aging, as measured at 64°C. This implies that Reclamite, itself, has good aging characteristics. At the Reclamite recommended dosage of 0.153 parts per 1.0 part asphalt, the rheological properties of the treated asphalt after $PAV_{20hours}$ (5 - 10 years of service life) were equivalent to $PAV_{10\ hours}$ of the untreated binder (3 - 5 years of service life).

Bending Beam Rheometer

Creep stiffness (S) data @ -12°C (10.4°F), assess the binder's response to thermally induced stress at the coldest expected temperature for the geographical region. Normally done on PAV-aged samples, the Superpave binder requirements are a maximum S of 300 MPa (300,000 kPA) with a corresponding minimum m-value of 0.300.

Reclamite lowered the stiffness and increased the m-value (see Table 3). However, the results for the untreated AC-30 show that it comfortably meets the S specification and meets the m-value specification even after 30 hours of PAV aging.

Again, the degree of reduction of the creep stiffness and increase of the m-value are dosage-dependent.

As an approximation, the m-value of Reclamite-treated asphalt (recommended dosage), after $PAV_{30hours}$ (8 - 12 years of field aging), was equal to the untreated asphalt after $PAV_{10\ hours}$ (3 - 4 years of service life).

Aging

The purpose of developing typical aging curves for Orlando streets is to project when pavements will fail to meet specifications and problems such as cracking can be expected to develop. Coupled with other information such as the effectiveness of rejuvenating agents added at various stages of the aging cycle, these curves would allow the City to develop a pavement management and monitoring strategy.

The dynamic shear test results in Figure 3 show that the majority of the post treatment cores tested would have values comparable to the virgin asphalt (AC-30) tested with an exposure time of 15 to less than 30 PAV hours. This is roughly equivalent to 5 to 12 years of aging in the field. The

pretreatment cores had values similar to the virgin asphalt for exposure time of 10 to more than 30 PAV hours.

The average G*/sin δ for the pretreatment cores is 14.8 kPa. The average for the post treatment cores is 11.7 kPa. The slope of the aging curve for treated AC-30 (at the manufacturer's recommended application rate) is 0.249 kPa/PAV hour. At this rate, post treatment binder would return to pretreatment values after 12 PAV hours or roughly 3 to 6 years. This would suggest that a reapplication time of 6 years might be appropriate. Additional testing as described in the following section is necessary to support this finding.

We were unable to develop satisfactory aging curves for in-place asphalt pavement representative of the current practice of the City of Orlando from the available data. The G*/sin δ values for the street cores—post treatment and pretreatment—corresponded to well aged (5 to 12+ years) virgin AC-30. This might be explained by differences between the actual paving material and the reference material. It is known that recycled asphalt is typically combined with new binder in resurfacing projects. This would explain higher DSR values for the pavement cores than for the reference AC-30. Running additional tests as recommended below would give us more points to correlate.

RECOMMENDED ADDITIONAL TESTING

Dynamic shear rheometer (DSR) testing at 25°C (77°F) should be performed on post treatment cores (and pretreatment cores, if available) for the four locations tested in Phase IIA. This testing should also be performed on the reference AC-30 material with a range of aging times up to 30 PAV hours. The purpose of this testing would be to establish whether asphalt cements typically used in Orlando meet the Superpave binder specification to prevent fatigue cracking at intermediate operating temperatures. The DSR testing performed thus far was targeted at achieving a minimum specified G*/sin δ value to avoid permanent deformation at high temperature. All of the cores tested were comfortably above this limit, so there is no need to consider this test further. Phase IIB testing has shown that, even with aging, the virgin AC-30 met the criteria for DSR at 64 °C and flexural creep stiffness and m-values at -12°C from the bending beam rheometer (BBR) testing.

Other testing that should be considered is aging and treating rather than treating and aging the AC-30. Reclamite would be added to virgin asphalt cement samples at increments of 10, 15, 20, 25 and 30 PAV hours. These treated samples would then be subjected to DSR testing at 25°C and BBR testing at -12°C.

Application/mixing rate for the Reclamite per the manufacturer's recommendation would appear to be appropriate for this additional testing.

Testing of the annual cores should include DSR testing at 25°C and possibly BBR testing at -12°C, if funding permits.

City of Orlando - Public Works Department
File No. 97-6327A

OVERALL FINDINGS

The results of this study suggest the following general findings:

- Reclamite®, at the specified application rate, imparts favorable properties to neat asphalt binders.

  When Reclamite was added to neat asphalt binder the complex modulus and stiffness were decreased. The asphalt binder viscosity and complex modulus from the cores decreased with the application of Reclamite at the specified rate. These values in the tested samples were not decreased to the degree that they were too low. However, over application could yield pavement susceptible to rutting at high temperatures.

- The application rate on the order of 0.06 gallons per square yard appears to be appropriate for a treatment period of about 6 years.

  The results of the laboratory testing on the neat asphalt binders suggest that the recommended application rate for Reclamite is appropriate for the conditions in which the City of Orlando is using it. The results of testing on artificially aged asphalt binder found that the complex modulus of the binder treated with the recommended dosage returned to pretreatment values after about 12 hours of PAV exposure (equivalent to 3 to 6 years of aging). Therefore, a treatment period of 6 years is within the range predicted by the test results. However, we note that the asphalt binder in the pavement in-place is probably substantially different than that used in the testing. The resurfacing program includes recycled asphalt and may include modifiers which could not be practically included in a testing program. The dosage rate used should be correlated to the pavement to be treated.

- The data suggest that the dosage rate for a relatively new pavement will be different than for a highly oxidized pavement.

  If Reclamite is applied to a new pavement, the application rate should be limited to avoid creating a low viscosity which allows ruts to develop under high temperatures. The data shows that the recommended application rate causes the complex modulus to decline to 1.163 kPa for unaged asphalt binder. This value should be at least 2.2 kPa to avoid rutting under high temperatures. Highly oxidized pavement can tolerate a higher level of treatment before reaching a level where rutting can be a problem. Also the older pavement may be less absorptive.

- The results of the core testing are variable and suggest that treatment is not as effective in the wheel path as it is in the remainder of the pavement.

  The average binder viscosity from the wheel path cores was less than the average for the centerline cores.

Asphalt Pavement And Recycling Technologies, Inc.
(APART, Inc.)

5207 Minter Field Avenue Shafter, CA 93263
Telephone: (661) 393-2748 Fax: (661) 393-2804
e-mail: apart@hughes.net

Report: 07-1227 **January 20, 2008**

Customer: CAM, LLC – Jack Witte

Project: RECLAMITE® Preservative Seal – Cities of Springfield, Moberly, Alton and Jefferson City

Samples submitted: 20 pavement core samples (10 treated and 10 untreated) identified as follows:

Jefferson City	Springfield	Moberly	Alton
County Club Street	Rocklyn Street	South Williams St.	N. Rodgers Ave.
J-1 treated	S-2 treated	T-1 treated	CA-1 treated
J-2 treated	S-1 treated	T-2 treated	CA-2 treated
JU-1 untreated	S-3 untreated	M-1 untreated	AL-2 untreated
JU-2 untreated	S-4 untreated	M-2 untreated	AL-3 untreated
	Covington Street		
	SA-1 treated		
	SA-2 treated		
	SU-1 untreated		
	SU-2 untreated		

Application rate for treated materials was reported as being 0.065-0.08 gallons/square yard at a 2:1 dilution (RECLAMITE®/water).

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 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph. Test results are reported by Table I.

Conclusion:

Reported data are based on the testing of limited sample submitted as being representative the treated and untreated pavements.

Table I
CAM, LLC
RECLAMITE® Preservative Seals

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Jefferson City, MO			
County Club Street			
J-1 treated	42.0	65.2	16
J-2 treated	31.6	52.4	18
JU-1 untreated	105	92.0	10
JU-2 untreated	66.0	80.2	12
Springfield, MO			
Rocklyn Street			
S-2 treated	33.6	50.8	17
S-1 treated	35.0	52.4	17
S-3 untreated	84.0	168	11
S-4 untreated	86.8	208	11
Covington Street			
SA-1 treated	39.0	52.4	16
SA-2 treated	34.6	53.8	17
SU-1 untreated	83.5	188	11
SU-2 untreated	84.8	176	11
Moberly, MO			
South Williams Street			
T-1 treated	13.2	16.7	27
T-2 treated	11.0	13.4	29
M-1 untreated	19.0	32.6	22
M-2 untreated	19.2	38.7	22
Alton, IL			
North Rodgers Avenue			
CA-1 treated	17.8	28.2	23
CA-2 treated	17.8	24.2	23
AL-2 untreated	34.0	40.0	16
AL-3 untreated	31.6	40.2	16

Asphalt Pavement And Recycling Technologies, Inc.

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Report: 09-1105 **November 11, 2009**

Customer: Corrective Asphalt Materials – Jack Witte

Project: City of Kansas City, Missouri, RECLAMITE® treatment

Samples submitted: Core samples representing 4 locations (treated and untreated) identified as follows:

	Treatment Date	Sample Date
Holmes (89th - Bannister)	9-24-09	
Untreated		9-18-09
Treated @ 0.06-0.065 gsy of 2:1 Dilute Reclamite		10-26-09
104th (Holmes – I 435)	9-23-09	
Untreated		9-18-09
Treated @ 0.07-0.075 gsy of 2:1 Dilute Reclamite		10-26-09
Minor Dr. (State Line - Wornall)	9-22-09	
Untreated		9-18-09
Treated @ 0.075 gsy of 2:1 Dilute Reclamite		10-26-09
Holmes (I 435 – Red Bridge)	9-24-09	
Untreated		9-18-09
Treated @ 0.065 gsy of 2:1 Dilute Reclamite		10-26-09

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 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph. Test results are reported by Table I.

Conclusion:

Reported data are based on the testing of limited sample submitted as being representative the treated and untreated pavements.

Table I
Corrective Asphalt Materials

City of Kansas City, MO.
Top 3/8-inch of Core Samples

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Holmes (89th - Bannister)			
Untreated	14.60	19.80	26
Treated	7.16	8.00	36
104th (Holmes – I 435)			
Untreated	100.9	283.2	10
Treated	9.68	14.95	32
Minor Dr.(State Line - Wornall)			
Untreated	29.90	42.57	18
Treated	4.00	6.24	46
Holmes (I 435 – Red Bridge)			
Untreated	19.45	30.08	22
Treated	2.97	4.37	53

	Increase in Penetration, %
Holmes (89th - Bannister)	38.4
104th (Holmes – I 435)	220.0
Minor Dr.(State Line - Wornall)	155.6
Holmes (I 435 – Red Bridge)	140.9

Asphalt Pavement And Recycling Technologies, Inc.
5207 Minter Field Avenue Shafter, CA 93263
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Report: 11-1123 **December 10, 2011**

Customer: Corrective Asphalt Materials, LLC – Jack Witte

Project: RECLAMITE® Preservative Seal – City of Bloomington, IL

Samples submitted: 12 pavement core samples identified as follows:

Graham Street #1 (Treated and Untreated)
Graham Street #2 (Treated and Untreated)
Prairie Street #1 (Treated and Untreated)
Prairie Street #2 (Treated and Untreated)
Park Street #1 (Treated and Untreated)
Park Street #2 (Treated and Untreated)

Application rate for treated pavement was not reported.
Untreated core samples were taken on 09-23-11.
Treated core samples 11-17-11.

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 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph. Test results are reported by Table I.

Conclusion:

Reported data are based on the testing of limited sample submitted as being representative the treated and untreated pavements. Since no untreated core was submitted the percent change in viscosity and penetration were calculated using data from the previously submitted Paseo #2 (Untreated) core. This data was reported by APART Report #10-1206.

Robert Stanforth

Table I

Corrective Asphalt Materials, LLC
City of Bloomington, Illinois
Top 3/8"of Core Sample

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Graham Street #1			
Untreated	37.80	45.43	17
Treated	9.17	9.97	32
Graham Street #2			
Untreated	37.36	49.90	17
Treated	12.79	13.35	28
Prairie Street #1			
Untreated	35.99	54.06	17
Treated	10.81	12.46	30
Prairie Street #2			
Untreated	33.35	41.14	17
Treated	12.97	15.55	28
Park Street #1			
Untreated	151.8	223.5	9
Treated	55.99	72.04	14
Park Street #2			
Untreated	154.8	233.9	9
Treated	55.10	71.55	14

Change in Asphalt Binder

	Viscosity, 25°C % Decrease	Penetration, 25°C % Increase
Graham Street #1	75.7	88.2
Graham Street #2	65.8	64.7
Prairie Street #1	70.0	76.5
Prairie Street #2	61.1	64.7
Park Street #1	61.6	55.6
Park Street #2	64.4	55.6

Asphalt Pavement And Recycling Technologies, Inc.
5207 Minter Field Avenue Shafter, CA 93263
Telephone: (661) 393-2748 Fax: (661) 393-2804

Report: 12-1101 November 5, 2012

Customer: Corrective Asphalt Materials, LLC – Jack Witte

Project: RECLAMITE® Preservative Seal – City of Bloomington, IL

Samples submitted: 12 pavement core samples identified as follows:

Mt. Vernon Drive, Untreated
Mt. Vernon Drive, Untreated
Mt. Vernon Drive, Treated
Mt. Vernon Drive, Treated
Mason Street, Untreated
Mason Street, Untreated
Mason Street, Treated
Mason Street, Treated
Koch Street, Untreated
Koch Street, Untreated
Koch Street, Treated
Koch Street, Treated

Application rate for treated pavement was not reported.
Untreated core samples were taken on 07-19-12.
Treated core samples were taken on 10-26-12.

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 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph. Test results are reported by Table I.

Conclusion:

Reported data are based on the testing of limited sample submitted as being representative the treated and untreated pavements.

Table I
CAM, LLC

City of Bloomington, Illinois
Top 3/8"of Core Samples

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Mt. Vernon Drive			
Untreated	49.06	51.21	14
Untreated	43.77	44.98	15
Treated	22.04	22.38	21
Treated	19.25	20.08	22
% Increase in Penetration	48		
% Decrease in Viscosity	125		
Mason Street			
Untreated	5.776	7.324	39
Untreated	6.237	6.837	38
Treated	2.582	2.056	57
Treated	2.562	1.821	57
% Increase in Penetration	48		
% Decrease in Viscosity	134		
Koch Street			
Untreated	34.22	31.41	17
Untreated	31.88	28.28	18
Treated	11.39	9.606	29
Treated	10.48	7.792	30
% Increase in Penetration	69		
% Decrease in Viscosity	202		

Corrective Asphalt Materials

Mailing Address:
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Phone: 618-254-3855
Fax: 618-254-2200

Locations:
300 Daniel Boone Trail, South Roxana, IL 62087
43W630 Wheeler Road, Sugar Grove, IL 60554

Corrective Asphalt Materials, LLC (CAM, LLC) manufactures Reclamite and certifies the final product will comply with the following TRICOR REFINING, LLC specifications

RECLAMITE® Asphalt Rejuvenating Agent

Specifications:

Tests	Test Method ASTM	Test Method AASHTO	Requirements Min.	Requirements 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 $\frac{PC + A_1}{S + A_2}$[5]	D-2006-70	---	0.3	0.6
PC/S Ratio[5]	D-2006-70	---	0.5	---
Saturate hydrocarbons, S[5]	D-2006-70	---	21	28

[1]ASTM 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.

[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 60 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, A_1 = First Acidaffins.
A_2 = 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.

TRICOR

SAFETY DATA SHEET

1. Identification

Product identifier **RECLAMITE**

Other means of identification

Product Code 1902

Recommended use Asphalt Rejuvenator

Recommended restrictions Must be diluted with water following manufacturer's recommendations.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Manufacturer: Tricor Refining, LLC.
Address: P.O. Box 5877
Bakersfield, CA 93388
24-hour Telephone Number: (661) 393-7110
CHEMTREC: 1-800-424-9300 (North America)
1-703-527-3887 (International)

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Carcinogenicity Category 1B

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Not available.

Prevention Obtain special instructions before use. Wear protective gloves/protective clothing/eye protection/face protection. Do not handle until all safety precautions have been read and understood.

Response IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting. IF exposed or concerned: Get medical advice/attention.

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	%
DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC		64742-52-5	<=40
EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT		64742-11-6	<=40
WATER		7732-18-5	<=40
PROPRIETARY INGREDIENTS		N/A	< 5

*Designates that a specific chemical identity and/or percentage 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. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
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	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	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. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

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
DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC (CAS 64742-52-5)	PEL	5 mg/m3	Mist.
EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT (CAS 64742-11-6)	PEL	5 mg/m3	Mist.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC (CAS 64742-52-5)	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.
EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT (CAS 64742-11-6)	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

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

Appropriate engineering controls Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves.

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

Physical state Liquid.

Form Liquid.

Color Not available.

Odor Not available.

Odor threshold Not available.

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range > 212 °F (> 100 °C) IBP

Flash point > 413.6 °F (> 212.0 °C)

Evaporation rate Not available.

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

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	

10. Stability and reactivity

Reactivity	The 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 ingestion hazard.
Inhalation	Prolonged inhalation may be harmful.
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	Not available.
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	Not available.
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	Contains a substance/a group of substances which may cause cancer. Contains polycyclic aromatic compounds (PACs). Prolonged and/or repeated skin contact with certain PACs has been shown to cause skin cancer. Prolonged and/or repeated exposures by inhalation of certain PACs may also cause cancer of the lung and of other sites of the body.

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 - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not available.
Chronic effects	Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence and degradability	No data is available on the degradability of this product.
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 component.

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 - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

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) Not regulated.

US state regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

US. Massachusetts RTK - Substance List

DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC (CAS 64742-52-5)
EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT (CAS 64742-11-6)

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

EXTRACTS (PETROLEUM), HEAVY NAPHTHENIC DISTILLATE SOLVENT (CAS 64742-11-6)

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

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 listing on the inventory administered by the governing country(s).

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

Issue date 05-30-2014

Revision date 03-27-2015

Version # 04

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information 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.

Revision Information Product and Company Identification: Product and Company Identification
Composition / Information on Ingredients: Ingredients
Accidental release measures: Personal precautions, protective equipment and emergency procedure s Physical & Chemical Properties: Multiple Properties

TRICOR
REFINING, LLC
Producers of Reclamite®

P.O. Box 5877
Bakersfield, CA 93388

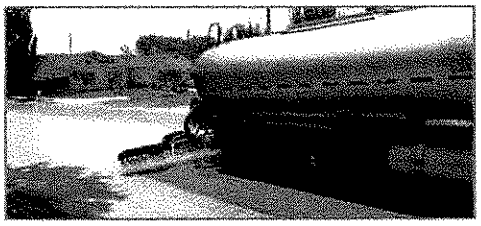
661.393.7100

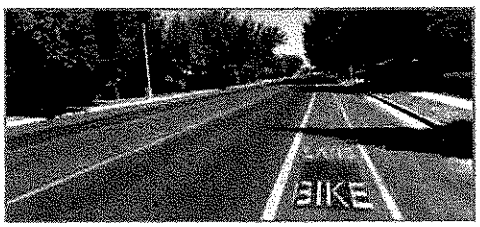
RECLAMITE®
Asphalt Pavement Rejuvenator

Reclamite® is a maltene-based cationic petroleum emulsion formulated to maximize and maintain high road ratings and extend the service life of your asphalt pavement, while conserving your maintenance budget.

Reclamite® Benefits:

- Delays the aging process
- Reverses aging
- Stops premature aging - reverses oxidation
- Waterproofs and seals
- Restores the components of asphalt
- Less than ⅓ to ½ the cost of other-wear course seals.





Reclamite® restores maltenes, the components of asphalt lost in the aging process, and improves the durability of the pavement near the surface where deterioration begins. Pavements in good profile, but exhibiting signs of aging—hairline cracking, raveling and pitting—will benefit from a Reclamite® application, as will pavements with segregation issues.

Reclamite® assists in adjusting the rheology of asphalt binder by increasing penetration values and decreasing viscosity and corresponding DSR (Dynamic Shear Rheometer) values.

Formulated from a single sourced naphthenic crude base, Reclamite® has a high natural solvency ability, co-mingling and fluxing with the asphalt binder to restore the asphalt/aggregate bond. It is a 100% petroleum rejuvenator base containing 0% asphalt.

Reclamite® has a proven 50-year history of use with national and international distribution. When used in pavement maintenance programs, application is usually on a 4 to 6 year basis. Product cost is generally ⅓ to ½ of conventional wear course treatments.

Reclamite® is used to extend pavement life at the top of the maintenance curve, pushing that curve as long as possible before more expensive wear course seals such as scrub seal, chip seal, slurry and cape seals are required.

Please contact your Tricor distributor for more information or visit tricorrefining.com to learn more about our products.

Fountain of Youth: Asphalt Maltene Rejuvenators Add Life to Pavements

The old saying that bituminous pavements start out black, and portland cement concrete pavements start out white, but both turn gray in the long run has merit because it's true. Asphalt pavements lose essential bituminous components as they age, turning black to gray, while concrete just darkens.

That loss of essential components is more than a cosmetic issue; the characteristics of an aged pavement are cracking, brittleness and loss of aggregate and oxidation, which together will compromise service life and pavement condition index number. For pavements that are in fair but not deteriorating condition, maltene-based rejuvenators applied as an emulsion can constitute the "right treatment, for the right road, at the right time."

"When asphalt binder is exposed to oxygen and the sun's ultraviolet rays, it begins to age and oxidize," say Richard Willis, Ph.D., and Nam H. Tran, Ph.D., P.E., National Center for Asphalt Technology, in their article *Rejuvenators Bring Back Life to Aging Asphalt Pavements* (*Asphalt Pavement*, July/August 2015). "The changes that occur to asphalt binders are primarily due to the chemical composition of the asphalt."

IMAGE CREDIT: FP² INC.

Delegates examine absorption of maltene-petroleum based rejuvenator application at 2016 National Pavement Preservation Conference demonstration

These changes take place in both short- and long-term stages, they say. Short-term aging is due mostly to the evaporation of volatile hydrocarbon compounds from the binder, oxidation or absorption of what they call "oily" components during the heat of production. Long-term aging takes place once the pavement is in the field, and is due to the reaction of asphalt components and oxygen in the atmosphere.

"These aging processes leave binders stiffer, less ductile, and with lower temperature susceptibility than conventional paving grade asphalts," Willis and Tran say. "The aging process reduces the ratio of oily maltenes in the binder, leaving a greater ratio of stiffer asphaltenes, which cause the asphalt binder to become less ductile. These viscosity and elasticity changes result in a hardened, brittle asphalt binder."

MALTENES AND ASPHALTENES

The key to understanding how maltene-based rejuvenator emulsions work is knowledge of what maltenes and asphaltenes are.

"What's left after refining and distillation of crude oil are the heavy resins at the bottom of the crude barrel, or asphalt," says Colin Durante, president, Pavement Technology, Inc., Westlake, Ohio. "Asphalt is sold and supplied based on its penetration or PG grading. In our industry we emulsify asphalt with water to make various products that can be sprayed on pavements to coat and protect them [fog or chip seals], or blended with aggregates and placed as [slurry and micro surfacings]."

True maltene-based rejuvenators are different. "Consider asphalt binder," Durante says. "The binder (pen or PG grade) will have heavy and black materials in it, called asphaltenes, and light oils and resins called maltenes. The maltene-based rejuvenator, which is the only true type of rejuvenator, is a blend of four maltene fractions with no black color to them, because it does not contain asphalt. Unlike asphalt emulsions, which protect and add binder to the surface, the maltene emulsion rejuvenator penetrates into the surface and combines with the weathered and oxidized asphalt binder holding the aggregate. It softens it, or changes its viscosity and durability."

IMAGE CREDIT: METROPOLITAN GOVERNMENT OF NASHVILLE-DAVIDSON COUNTY

Nashville has adopted the use of pavement rejuvenators like Reclamite to protect pavement that is three to five years old; pink color typical until emulsion breaks

Thus, the rejuvenator asphalt maltene-based emulsion penetrates and combines with the asphalt binder in-depth, making it sticky again so it can keep the aggregate matrix together—the result of the rebalancing of the maltene distribution ratio.

"If you spray WD-40 on a rusted bolt, it will break the surface tension and go inside and loosen it," Durante said. "The surfactant and wetting agents we put in the rejuvenator/water mixture do the same thing; they make the emulsion wetter, so it can break the surface tension of a pavement and get into the voids of the pavement matrix.

"Once the rejuvenating oils are down where you want them in the pavement," he added, "the water evaporates, leaving the maltene oils *in* the pavement. It's similar to how an asphalt emulsion spreads the asphalt *on* the surface, where the water evaporates, leaving the asphalt film where you want it."

Petroleum- or maltene-based rejuvenators aren't the only product being sold as rejuvenators. "Recently, some proprietary

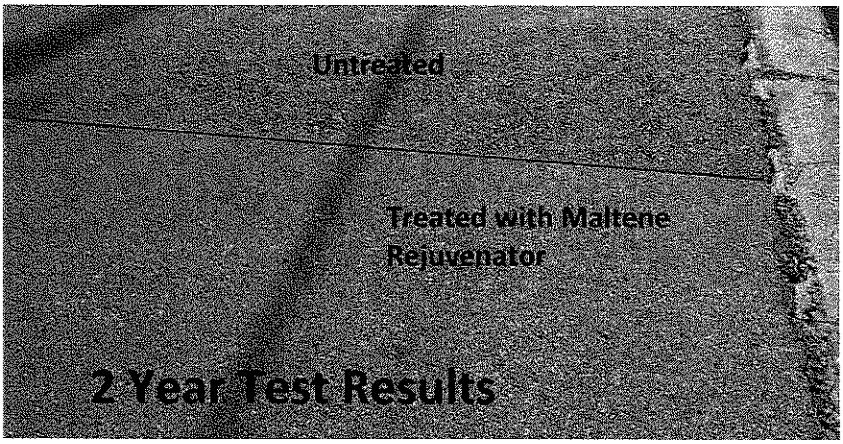


IMAGE CREDIT: PAVEMENT TECHNOLOGY, INC.

After two years, maltene-rejuvenated pavement does not show aggregate loss compared to untreated section

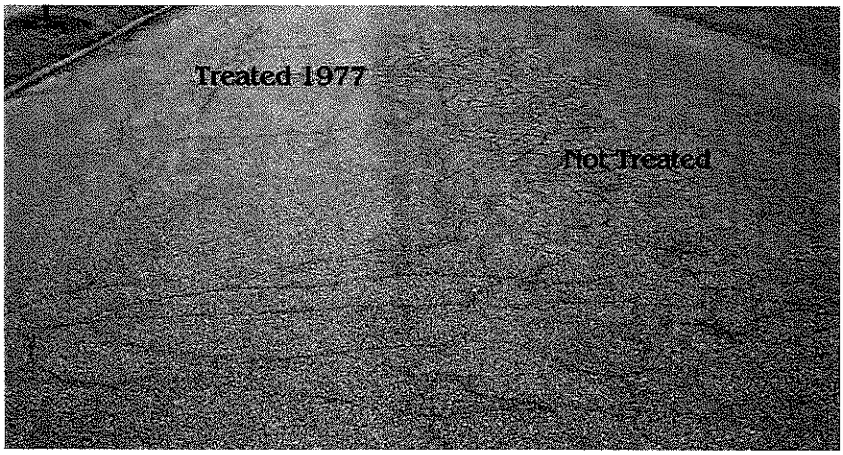


IMAGE CREDIT: PAVEMENT TECHNOLOGY, INC.

After 32 years, 2009 photo shows performance of 1977 maltene-based rejuvenator emulsion-treated pavement in Cleveland, Ohio

recycling agents made from bio-based oils have been marketed and sold as rejuvenating agents," say NCAT's Willis and Tran.

"A true rejuvenator changes what's underneath, by replacing missing maltene oils and resins," Durante said. "Most of the bio-based materials are composed of various diluents derived from agricultural sources. These diluents may be an oil extract of citrus peels called d-limonene or were created from the production of bio-diesel from soy beans known as methyl soyate or methyl esters. These types of products will dissolve asphalt binder to soften it but cannot replace the natural petroleum oils and resins missing from the asphalt binder. They provide workability, softening the asphalt; but there's no improvement in durability because they can't add back the missing maltene fractions."

REJUVENATOR EMULSIONS

An asphalt emulsion is a homogeneous mixture of two insoluble substances: oil and water. In it, particles of liquid asphalt (the dispersed phase) are surrounded by molecules of water (the continuous phase).

Asphalt emulsions are produced by dispersing tiny globules of asphalt into water treated with a small quantity of emulsifying agent. The dispersion takes place in a powerful blender, called a colloid mill, where spinning blades break or shear the liquid asphalt into suspended microscopic particles. The water, or soap solution, is immediately introduced to form the emulsion.

The emulsifier—an engineered surfactant (detergent) or surface-active agent—maintains the microscopic asphalt droplets in a stable suspension, keeping them from recombining. The amount and type of surfactant used, along with other variables, controls properties of the emulsion critical to performance in the field application.

Maltene-based rejuvenator emulsions like Reclamite aren't strictly asphalt emulsions, but they are an emulsion manufactured from a naphthenic crude stock. The naphthenic base is wax free, has a natural low pour point and has excellent solvency, allowing it to penetrate and be absorbed.

Typically rejuvenator emulsions are spray-applied at a rate of 0.04 to 0.10 gal./sq. yd.) for a diluted maltene-based rejuvenator emulsion, placed by a computerized distributor truck, according to FP² Inc. The rejuvenator restores the components of asphalt lost in the aging process, and it's designed to penetrate, flux and co-mingle with the existing asphalt binder.

"Maltene-based rejuvenators may offer a low-cost and effective pavement preservation treatment when applied correctly on pavements in newer condition, or in the mid-to-higher pavement condition index (PCI) range," FP² reports in its *Preservation Toolbox*.

As always, preservation treatments must be the right treatment, placed on the right road at the right time. Therefore rejuvenating emulsion applications should be used on mid-to-higher PCI asphalt pavements that are structurally sound. They can also be effective on aged chip seals, encouraging chip retention by slightly softening the binder and resetting the chip. They are very effective for pavement-shoulder preservation.

However, there is a limit to their performance. Rejuvenator emulsions should not be used on pavements with moderately or severely distressed surfaces, pavements with poor skid resistance or rutting, or roads that cannot be closed or partly closed to traffic during the curing period, FP² reports.

And rejuvenator emulsions, if improperly applied, may initially reduce skid resistance, especially when applied too heavily, FP² says, adding usually they are sanded to reduce friction loss.

PART OF PROGRAM

Asphalt emulsion-based rejuvenators have a place alongside chip seals and slurry surfacings in agency pavement preservation programs, experience shows.

But rejuvenators are relatively new in the game, having been introduced in the 1960s as a pavement preservation treatment. And generally, pavement management programs don't include asphalt rejuvenators within their software due to lack of that knowledge by the program developers, and due also to established histories of chip seal or slurry wear course treatments.

Travis County, Tex., has used maltene-based Reclamite rejuvenator successfully for years, said Don Ward, P.E., former director of road maintenance and fleet services, Travis County. and now engineering sales manager, Pavement Restoration Inc.

"Rejuvenators penetrate into aged hot mix asphalt and revitalize it," Ward said. "When we did the first neighborhood in Travis County, where Austin is located, the rejuvenator penetrated down to nearly an inch, because the pavement was fairly aged and oxidized," Ward said. "The older a structural layer is, the further it will penetrate as far as it can."

IMAGE CREDIT: PAVEMENT TECHNOLOGY, INC.

After rejuvenator placement, light coating of sand is applied to enhance friction

There's a difference between real rejuvenators and products that make a gray, aged surface look new again, he said.

"During my tenure with the county we had lots of experience with that," Ward said. "If someone had a new product they wanted us to try out, we'd do a demo with them. We had products come out that looked black for a month, and then all of a sudden, they would start to peel off the wheel paths. We'd see striations, and a year later it would be gone."

Ward did his due diligence before first using Reclamite rejuvenator in Travis County 14 years ago. "I did extensive research and traveled to a number of states to look at products applied," Ward said. "I was taken aback by how the product worked. A county in Florida had 15 years of documentation and was able to demonstrate how millions of dollars had been saved preserving pavements with maltene-based rejuvenator."

Likewise, Ward is convinced the rejuvenator saved money for Travis County. "After years of using it I am totally convinced that it saved taxpayers big money, and will save government entities—counties, cities and states—hundreds of thousands of dollars in deferred costs alone."

Also, Visalia, Calif., has successfully used maltene-based rejuvenators in its pavement preservation program since about 1990.

The City of Visalia's goal was to maintain the high street PCIs shown by its pavement management system program with a lower cost treatment, extending pavement life by four to five years. Application of an asphalt emulsion-based rejuvenator has led to increased PCIs on Visalia streets, while the city has raised the level of public awareness of pavement preservation though an in-house media promotion.

In Visalia, the application rate varies between 0.07 to 0.10 gal per sq. yd. of the asphalt emulsion diluted with water 2:1. The job is to maximize the absorption of the rejuvenator, then allow it to cure for a minimum one to two hours, followed by sanding and mechanical sweeping within the same day or within a 24-hour period.

Penetration and viscosity testing utilizing Caltrans test methods and dynamic shear rheometer (DSR) testing showed substantial improvement in penetration and viscosity, leading to reduced stiffness of the binder and retarding the aging process. Visalia's use of rejuvenators has been so successful that it received the 2015 *Project of the Year Award* from the Western Region Association for Pavement Preservation (WRAPP, formerly the California Chip Seal Association).

REJUVENATING RAP AND RAS

Rejuvenating applications may also be used to rejuvenate good quality reclaimed asphalt pavement (RAP) millings for base placement, or for a final ride surface for lower volume rural, residential or regional road applications, FP^2 says, adding they can be a good choice for this purpose, as they don't over-asphalt the existing RAP binder, manufacturers say.

Asphalt emulsion-based rejuvenators can be used to improve performance of reclaimed asphalt shingles (RAS) as well.

"Rejuvenators are one way to improve some performance properties of the asphalt binders found in RAP and RAS," say NCAT's Willis and Tran. "Although research has begun on the use of rejuvenators with asphalt mixtures containing higher recycled contents in the field, there are still many questions that need to be answered regarding their use."

The Texas DOT found that rejuvenators can improve RAP mixes. "The initial work ... has shown the use of rejuvenators in recycled mixtures can improve the cracking resistance of these mixtures without adversely affecting their resistance to moisture damage and permanent deformation," says Robert Lee, flexible pavements engineer for the Texas DOT. "In the laboratory, all of the mixtures using rejuvenators did improve the moisture susceptibility and rutting resistance of the mixtures containing recycled materials."

Article provided by Pavement Technology, Inc.

The Role of an Asphalt Rejuvenator in Pavement Preservation Use and Need for Asphalt Rejuvenation

Jim Brownridge - Marketing Manager - Tricor Refining, LLC
Bakersfield, California 93312

ABSTRACT

An asphalt rejuvenator was introduced in 1960 by the Golden Bear Oil Company. That product was Reclamite® It has a history of use spanning 50 years. In an era of moderately low price asphalt products, this rejuvenator was ahead of it's time. Hundreds of laboratory tests and field trials have been performed to determine the best possible formula and procedures for applying an asphalt rejuvenator.

There are many methods of surface treatments entailing use of asphalted emulsions with the predominant focus on gluing and binding the aggregate. Rejuvenators are derived from very specific crude stocks and are not as generic in their manufacture, thus on a national level, product availability as well as manufacturer/refiner marketing has impacted limited expansion and use of the products. But…asphalt rejuvenators have been one of the most field tested applications there are. This paper presents the technical components of an asphalt rejuvenator and how they differentiate from generic asphalt emulsions. Discussion is focused on fog seal use of rejuvenators. Long term test results are presented as well as a visual perspective showing the appearance of before and after treatments.

Conclusive history shows that a properly formulated asphalt rejuvenator meets stipulated requirements and is a proven method to extend pavement life at a low cost.

Keywords: Golden Bear Oil, maltenes, pavement preservation, RAP, rejuvenator, RAP, Reclamite®, Tricor, Witco.

1.0 INTRODUCTION

Pavement Preservation is now on the mind of every agency charged with maintaining their inventory of asphalt pavements. The current volatilities in crude have seen asphalt pricing skyrocket, then plunge. This rollercoaster has created a difficult task for agencies budgeting and controlling their maintenance dollars. Many county and state agencies over the years have evolved operations to perform their own in house chipseal or slurry applications. This method had become more of a nationwide industry standard to maintain asphalt pavements at a relatively low cost. Under present economic conditions gone are the days of agencies doing the large 35 to 50 mile wear course seal projects. Because of the structure of these in house agency programs, much of this work has and had been done on newer asphalt pavements incorporating roads into these programs that may not have required a wear course and were sealed because of that program in place, use of the in house equipment and use of in house manpower. It was simple and dollar funding, aggregate sources and low priced emulsion were available.

In our current economic climate there has not been a more opportune time for agencies to consider rejuvenator use. Price has never been the objection in the use of a rejuvenator. Rejuvenators have a very long history of use – 50 years to be exact and have been studied extensively from the Corps of Army Engineers, US Department of the Navy[3], Independent States and the National Center for Pavement Preservation most recently in the National Sealer Binder Study and the California Pavement Preservation Center Fog Seal and Rejuvenator Study.

Yet…Very few have a good grasp on product use and what a rejuvenator is.

The intended use of an asphalt rejuvenator is to keep good roads in good condition. When evaluating pavement preservation treatments it is appropriate to think in terms of extended life rather than design life. "Pavement Preservation is to take a newly constructed pavement and extend its service life affording the agency significant real cost benefit savings." We now hear from the FHWA Expert Task Group Saying:

An effective pavement preservation program
will address pavements while they are
still in good condition before the onset of
serious damage.

AASHTO Highway Subcommittee on Maintenance Says:
Preventative maintenance is typically applied to pavement
in good condition having significant remaining
service life. As a major component of pavement
preservation, preventative maintenance is a strategy of
extending the service life by applying cost-effective
treatments to the surface of structurally sound pavements.

Industry is also hearing much from the green movement; "rejuvenator use will reduce aggregate resource depletion, and dramatically reduce carbon emissions, for the least possible cost!" Reducing the carbon footprint is the widely used phrase.

As stated in the NCCP booklet titled [1]"A Quick Check of your Highway Department Health" Assume every lane mile of road in the network was rated by the number of service years remaining until the end of it's life (terminal condition) If no improvements are made in 1 year then it's remaining service life will decrease by 1 year except for those stacked at zero. The zero stack will increase significantly until the agency has the majority of road inventory in the zero stack and obviously no funding to change this. Assigning priorities to fixing worst first or reconstruction is a proven death spiral for agencies. This "zero stack" is the situation the majority of our regional cities and towns are now in.

So why is it that asphalt rejuvenators, a product studied more than many other types of treatments, yet so unknown by many in academia and those charged with maintaining our nation's pavements having a good grasp of a rejuvenators use – both as a surface treatment tool and for RAP rejuvenation?
It is the writer's opinion that to many, belief that the fluxing, solvency, co-mingling phenomenon that occurs is too good to be true. Of course in the product application there is a little pain for much gain. That pain is in terms of some product tracking because of a little longer cure time and the sanding that is routinely required as a blotter. In our rejuvenator studies different surfactant technology have been tested as well as base oil modification but the fact remains that in order for a rejuvenator to penetrate it cannot be retarded by blending in an asphalted emulsion or formulated into a quick dry emulsion. Once you stop the absorption then you lose the rejuvenation effectiveness. There are many asphalt emulsions being marketed that claim their rejuvenation capability. The fact remains if the emulsion breaks or cures on the pavement surface then it is sealing, not rejuvenating.

Commenting on conventional methods of gluing and binding, use of wear course seals. These methods leave a void in the pavement preservation curve – use of the too good to be true rejuvenator is now front and center.

Rejuvenators are derived from very specific crude stocks and are not as generic in their manufacture, thus on a national level, product availability as well as manufacturer/refiner marketing has impacted limited expansion and use of the products. But…asphalt rejuvenators have been one of the most field tested applications there are.

The Concept of Pavement Preservation with Rejuvenators:

- Is the maximizing performance of assets while minimizing the cost of ownership of those assets.
- Is establishing a minimum PCI for you inventory and working to increase that PCI
- Is about extending the RSL (remaining service life) of a pavement

2.0 SCOPE

Beginning in the mid 1950's. the rejuvenator Reclamite® was developed out of the work done by [2]Dr. Fritz Rostler and Richard White. " It is generally recognized that failures of asphalt pavements caused by embrittlement and other changes in physical properties during the aging process are due to chemical reactions of all or some of the asphalt components".

The approach of wear course seals – slurry and chipseal as with other asphalted emulsions is to bind and glue versus reconstituting the existing binder and improving it. They both have specific uses and it is the presenter's opinion that many pavements receive a wear course seal that are perfect candidates for rejuvenation for several reasons;

1. Because of lack of knowledge by the agency,
2. Promotion by the contractor,
3. The belief that a wear course will yield a longer service life.
4. Cosmetic Attributes

Many studies on both the cause and effect of asphalt aging have been reported. The interpretations of causes of aging range from; the assumption that asphalt hardening and embrittlement is purely phenomenon of evaporation of the light fractions; to more thorough explanations predicated on the correlation of chemical composition of asphalt to long-term performance on the road. That is the relationship of the chemical fractions that make up asphalt.

What are the main functions of an asphalt rejuvenating agent?

- They are engineered cationic emulsions containing maltenes, saturates (light fractions)
- Their primary purpose is to soften the stiffness of the oxidized AC pavement surface and flux with the asphalt binder to extend the life of the pavement surface by adjusting properties of the AC mixture. Maximum absorbance of the rejuvenator is expected.
- To extend the life expectancy or service life of the restored pavement.

To fulfill the above functions, there are keys to a properly formulated rejuvenator:

- Proper base is essential. A naphthenic or wax free base is ideal – the molecular make up offers more solvency or absorption and fluxing ability with the binder.
- Rejuvenators are manufactured as emulsions – typically 60-65% residual. They have the ability to "wet" the asphalt binder that is present.

Rostler developed what we refer to as the "Rostler Analysis". This is ASTM Test D-2006-70 which determines the relationship of the light fractions maltenes/acidiffins/saturates shown in Table 1 It sets the stage for a properly formulated rejuvenator.

Table 1

			Min	Max
Maltene Distribution Ratio $\frac{PC + A_1}{S + A_2}$	D-2006-70	---	0.3	0.6

Chemical composition by ASTM Method D-2006-70:

PC = Polar Compounds, A_1 = First Acidiffins.

A_2 = Second Acidiffins, S = Saturated Hydrocarbons.

Note: ASTM D-2006-70 (last updated in 1970) is also referred to as the Rostler Analysis because of the development by Fritz Rostler. The test was predominately used in the rubber extender industry and adopted for use by all suppliers including Tricor. This test has since been replaced in the rubber industry but the Rostler Analysis functions very well and produces valid test results and a better understanding of the chemical components for the rejuvenator oils and emulsions. Rostler spent a great deal of time working with the FHWA on this test method.

3.0 TECHNICAL

WHAT IS AN ASPHALT REJUVENATOR?

Asphalt consists of two main fractions shown in Figure 1:
"asphaltenes" which are the hard brittle component, insoluble and not affected by oxidation and the highly reactive sub-fractions: "maltenes" The maltenes are oily and resinous in appearance

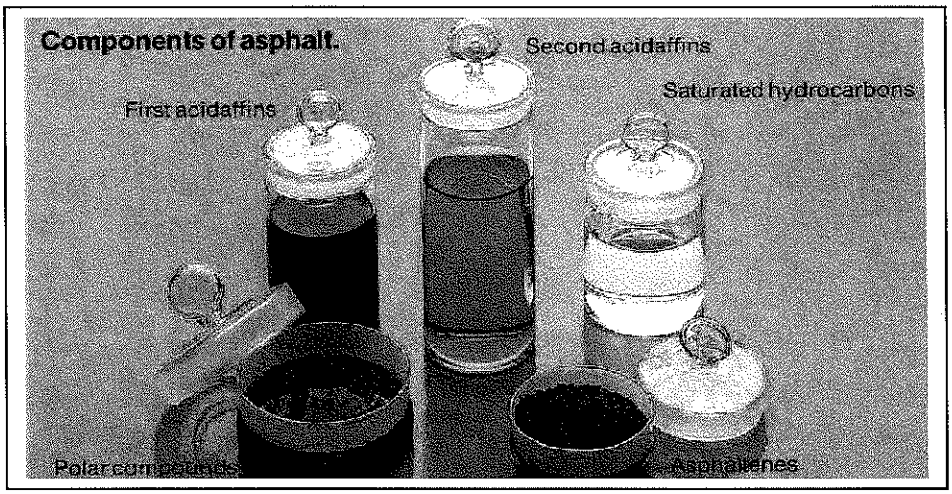


Figure 1

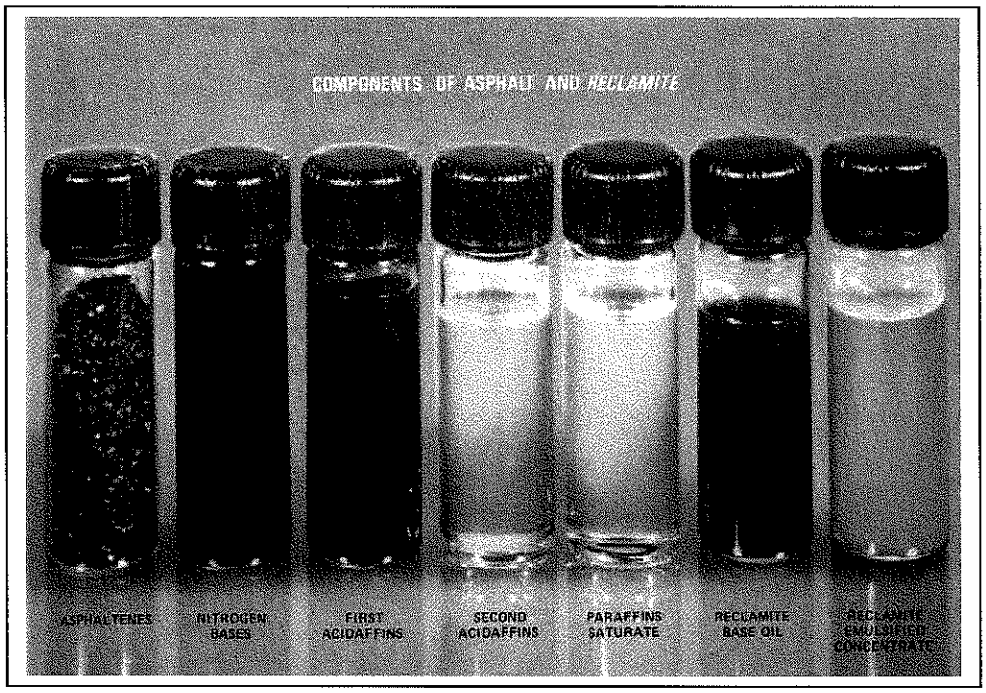


Figure 2

Rejuvenators need to be a fine-particle size cationic, oil in water emulsion of a selected blend of maltene components shown in Figure 2, tailored to facilitate and assure the desired mode of incorporation of the added maltene fractions, into an asphalt pavement. Specific properties are summarized in Table 2 on page 7.

Many features are considered and built into the rejuvenator formulation, keeping in mind that after penetration of the emulsion into the asphalt pavement the essential function is to deposit the blend of maltene fractions on the films of aged asphalt without disturbing the existing structure of the asphalt-aggregate mix with respect to adhesion, cohesion and stability. Of importance is that the deposited maltene fractions must then flux with the aged asphalt in place. Stability of the emulsion, ease of handling and simplicity of application are other significant objectives. A cationic emulsification system is needed which will penetrate rapidly into the pores of the asphalt pavement, without displacing the asphalt films from the aggregate or destroying the existing structure of the asphalt-aggregate mix. Figure 4 on Page 8 shows how the composition of asphalt changes

Table 2

Asphalt Rejuvenating Emulsion Specification
(There is actually 0% asphalt in a maltene rejuvenator) Up to 1% allowed for tank truck contamination)

Specifications:

Tests	Test Method ASTM	AASHTO	Requirements 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	---	0.4	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	

[1]ASTM 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.
[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 60 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. A_1 = First Acidaffins.

There are differences of opinion in defining the chemical composition of asphalts. It is generally accepted that asphalt consists of two main fractions: asphaltenes and maltenes. The maltenes consist of sub fractions which are oily or resinous and chemically reactive.

The principal obstacle to understanding the chemistry of asphalt aging was the lack of a reliable method of subdividing and defining the resinous and oily fractions of the maltenes. The Rostler analysis provides such subdivision by determining four principal fractions of maltenes:

Polar Compounds	PC
First acidaffins	A^1
Second acidaffins	A_2
Saturates	S

The influence of maltenes on the durability of asphalts as cementing agents has been show to depend on the ration of these four fractions. The parameter: $\frac{PC + A_1}{S + A_2}$

The ratio of the more reactive to the less reactive fractions has proved a useful guide. Figure 3 shows the typical changes in chemical composition with aging of a typical asphalt pavement.

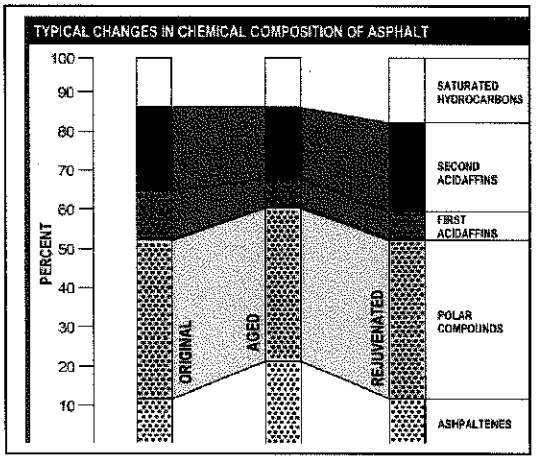


Figure 3

4.0 MEASURING THE EFFECTIVENESS OF AN ASPHALT REJUVENATOR

We know the benefits of an asphalt rejuvenator are:

1. Increasing the penetration value of the asphalt cement in the top portion of the pavement which extends the pavement's lifecycle.
2. Sealing pavement against intrusion of air and water, thereby slowing oxidation, preventing stripping and raveling and protects the pavement in-depth.
3. Increasing the durability of the asphalt in the top portion of the pavement by improving the chemical composition of the asphalt cement.

How to Measure the Effectiveness

- Measure the reduction in viscosity of the aged asphalt binder to determine the rejuvenators effectiveness. (See Table 3)
- The viscosity of the recovered binder before and after treatment is determined.
- The test methods for the extraction and recovery of the asphalt binder and viscosity measurement need small quantities of mix.
- 4 inch or 6 inch pavement cores are taken and the viscosity of the recovered binder is measured
- Normally the top ½ inch layer of the core is removed for this determination.

California DOT (Caltrans)[4] test methods are used:

- California Test Method CT 348 – "Method of Test for Determining the Viscosity of Bituminous Materials by Means of the Sliding Plate Micro viscometer"

- California Test Method CT 365 – "Method of Test for the Micro-Recovery of Asphalt from Bituminous Core Slices". (Penetration)

Table 3

Core Location	Micro viscosity, 25°C, MP		Equivalent Penetration
	0.05 Sec-1	0.001 Sec-1	
R1 (Untreated)	53.0	750	14
R1 (Treated)	15.5	42.2	25
R2 (Untreated)	50.0	655	14
R2 (Treated)	7.6	20.8	41

It is well documented and shown by the figures in Table 3 above and Table 4 how a rejuvenator adjusts viscosity:

- Restores proper balance among the five asphalt components.
- Restores flexibility and ductility to the top portion of the old, brittle pavement.
- Stops raveling and stripping of the aggregate.
- Road markings and striping will remain visible.
- Seals surface against intrusion of air and water.

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 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate micro viscometer (CTM 348). Penetrations were calculated from a nomograph. Test results are as follows:

Table 4[5]

Core #	Core Identification Travis County, Texas	Micro viscosity, 25°C, MP		Equivalent Penetration
		0.05 sec^{-1}	0.001 sec^{-1}	
1 B	"Before" Letti Lane	90.0	128.0	11
1 A	"After" Letti Lane	22.6	44.5	21
2 B	"Before" Cranston Drive	104.0	112.0	10
2 A	"After" Cranston Drive	30.0	75.0	18
3 B	"Before" Blackthorn Drive	39.1	255.0	16
3 A	"After" Blackthorn Drive	3.50	7.45	49
4 B	"Before" Shiner Street	40.6	120.0	16
4 A	"After" Shiner Street	3.75	9.50	48
5 B	"Before" Stormy Ridge Road	160.0	174.0	8
5 A	"After" Stormy Ridge Road	14.0	42.4	26
6 B	"Before" Briner Pass	78.5	148.0	10
6 A	"After" Briner Pass	2.52	5.20	57
7 B	"Before" Denim Trail	162.0	259.0	8
7 A	"After" Denim Trail	0.5	2.8	110

As shown in Table 4 above, viscosity is reduced and corresponding penetration values increased appreciably.

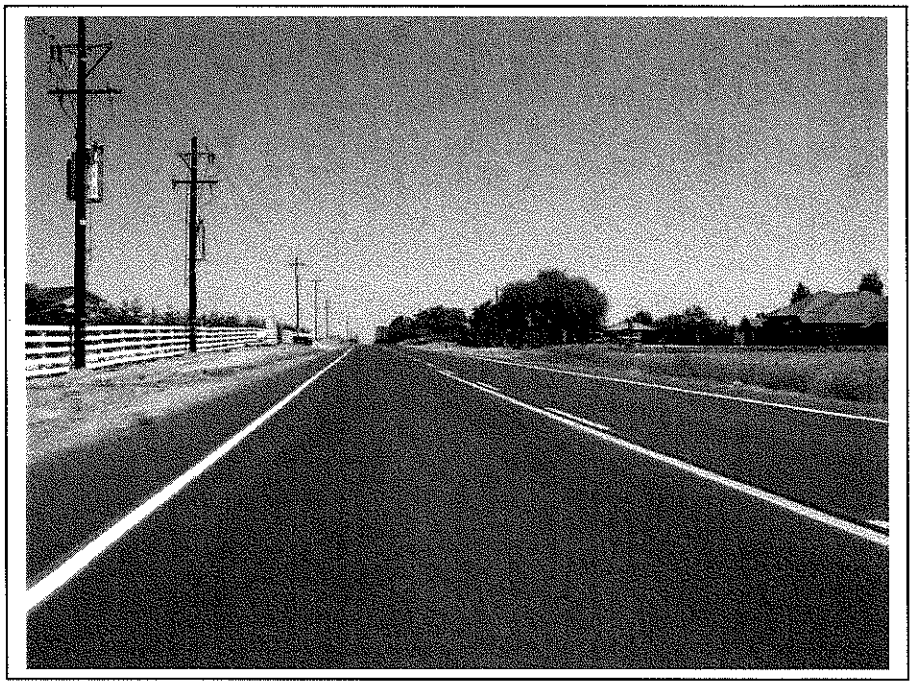
5.0 WHERE TO USE AN ASPHALT REJUVENATOR

A well planned program of preventative maintenance is one which takes into consideration the characteristic behavior of asphalt. The aging process is caused by chemical changes in the asphalt. The original concept for the asphalt rejuvenator Reclamite® that came on the market in 1960 was a product that would reconstitute the asphalt. To keep "good" roads in "good" condition. The functional use was to revitalize aged asphalt in place, stop and reverse the shrinkage process which results in hairline cracking, to inhibit pitting and raveling, to reduce air and water permeability. This concept is unchanged today.

Asphalt Pavement Surface Treatments – the typical candidate is a asphalt pavement in the 3-7 year age range. But this is only a benchmark as rejuvenators are used as a construction seal to new asphalt to decrease permeability. They are used on segregated pavements, pitted and raveled pavements. The ideal candidate is a pavement with no base failure, good profile but showing the early signs of distress as stated above.

Photograph 1

Photograph 1 shows the tightening and densifying effect of a rejuvenator treated pavement. (State of Idaho)



Photograph 2

Photograph 2 shows the appearance of a treated road in the County of Merced, California

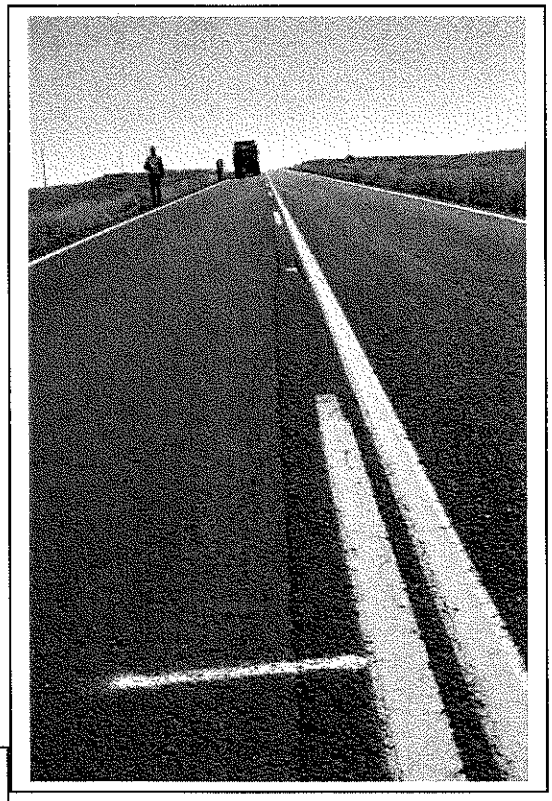
Photograph 3

Photograph 3 shows the results of a 10 year study between 1977 and 1987 – City of Cleveland, Ohio – rejuvenator application is to the left. Photo depicts the noticeable tightness and densifying of the binder.

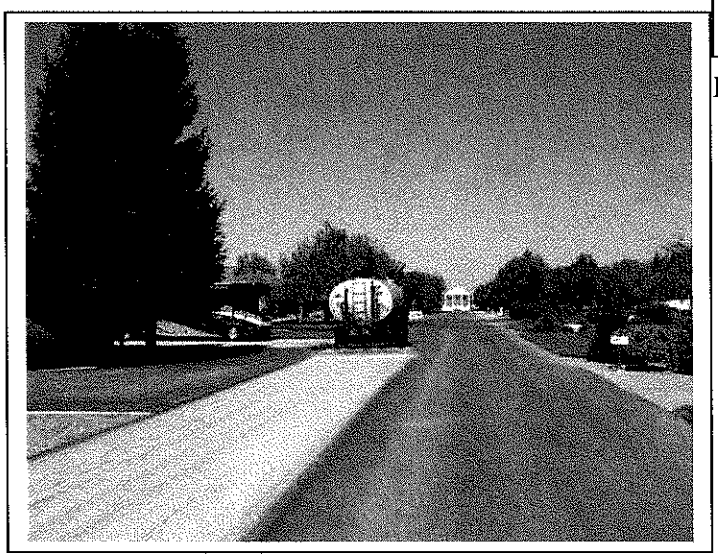
Photograph 4 taken October 19, 2006 , Reclamite® rejuvenator emulsion placed September 2001 Sealed for 5 Years

Reclamite® Engineered Emulsion Hwy 95 40 miles north of US Interstate 40 , Winslow, Arizona. FP2 Sealer Binder Study

Note the fluxing, densifying of the binder in the Left lane which was sealed. The right lane was Unsealed.



Photograph 4



Photograph 5
Photograph 5 shows the typical appearance of a rejuvenator fog seal application City of Lemoore, California (Central Valley Region)

6.0 CONCLUSION AND COMMENTS

1. A properly formulated non asphalt base rejuvenator manufactured as an emulsion conclusively has shown its ability in 1000's of core tests to extend pavement life by restoring the light fractions (maltenes) to the oxidized and dry binder in the top ¼ - 3/8 inch of asphalt surface when used as a fog seal application.
2. It is in this top portion of asphalt that surface distress makes its way to decay and erode the underlying asphalt. The maltene fractions "wet" the existing asphalt, fluxing with, densifying through their solvency effect with the binder. The molecular make of the naphthenic base oil used in the formulating provides this solvency all without the use of distillate or solvents as we know them.
3. The wetting densifying function reverses the drying effect caused by air, moisture, time to reverse the aging effects.
4. The rejuvenator seals the pavement against intrusion of air and water, thereby slowing oxidation, preventing stripping and raveling and protects the pavement in-depth.
5. The rejuvenator increases the durability of the asphalt in the top portion of the pavement by improving it' chemical composition.
6. In current global economic times – rejuvenators are the new green emulsion – no cutbacks or solvents, less use of haul trucks, less use of aggregate.
7. "With the right care, the miles don't show" - Engineered Asphalt Rejuvenator emulsions can be a maintenance department's lowest cost surface treatment alternative to extend pavement life

Non asphalted rejuvenators both as emulsions and base oils find use in both cold recycling and hot recycling. The end result is much the same as the fog seal rejuvenator use – restoration of the maltenes and restoring them in select chemical balance.

ACKNOWLEGEMENTS

The author would like to thank Tricor Refining, LLC, Bakersfield, California for the use of their history library.

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4. Technical Report R690. Reclamite® as a Life Extender for Asphalt Concrete Pavements. *Navy Facilities Engineering Command, Port Hueneme, California* August 1970
5. Table 4 Ward Don, Director of Transportation Services Travis County, Austin, Texas, Wiggins Robert, Pavement Restoration, Inc., Boerne, Texas, Escobar Steven, Staugaard Bob, (APART) Asphalt Pavement and Recycling Technologies, Inc., Shafter, California
6. Photograph 5 Durante, Colin., Pavement Technology, Inc., Westlake, Ohio
7. Photographs and Figures courtesy of Tricor Refining, LLC

Rejuvenator Seal Extends Life of Austin, Travis County, Tex. Roads

By Jim Brownridge
Marketing Manager
Tricor Refining, LLC, Bakersfield, Calif.

Texas' dynamic capital of Austin is located within Travis County, and a great majority of the road network encompasses Austin.

This road system is a blend of moderate and highly traveled residential curb and gutter and lower volume rural areas. Texas uses a gradation numbering system consisting of Type A and B, which are coarse and fine base course mixes; Type C and D being coarse and fine hot mix; and Type F being a fine-graded, high asphalted hot mix used for thin overlays.

Travis County Director of Road Maintenance and Fleet Services Don Ward inherited the maintenance challenge of how to preserve 125 two-lane miles of F mix roadway. Originally F mix was used in residential curb and gutter subdivisions to provide a smooth, appealing surface. But it became evident within four to five years that this mix was prone to weathering and intrusion of moisture, while the high asphalt percent was causing premature oxidation and brittleness in the binder as the lighter oils oxidized from the binder. The county needed a solution to prolong the life of a considerable F mix inventory.

Pavement Restoration, Inc., Boerne, Tex., applies Reclamite rejuvenator to pavement in Travis County, Tex.

MALTENE-BASED REJUVENATOR STUDIED

In 2005, Travis County looked at the use of a maltene-based rejuvenator that has had over 40 years of use in North America.

Rob Wiggins, president of Pavement Restoration, Inc., Boerne, Tex., reviewed the road inventory with Don Ward and along with Tricor, the manufacturer, provided factual data incorporating many years of experience of how a rejuvenator could extend the county's pavement life cycles.

About that time Travis County executives realized that they needed to be proactive regarding road maintenance. The county Commissioners Court approved this rejuvenation process with an eye to extending pavement life an additional five to eight years, and hopefully beyond with subsequent applications.

The county placed several full road-width test sections of the rejuvenating agent. They saw excellent absorption and penetration into the binder. Testing done by APART, Inc. (Asphalt Pavement and Recycling Technologies, Inc., Shafter, Calif.) revealed to Travis County that the rejuvenator was fluxing with the binder, and results showed a decrease in microviscosity of the binder in the range of 60 to 300

percent, along with a corresponding increase in penetration values.

It became evident that the rejuvenator could work in Travis County. The use of a rejuvenator was of most interest as product cost was one-third to one-half the cost of the closest alternate, which would be a wear course seal. Using that alternative, the condition of the F mix—along with the many miles of inventory—would have deeply impacted the county budget (wear course seals being chip or Type 1 and 2 slurry are placed on more severely distressed pavements in the county).

PROGRAM COMMENCES

Starting in 2006, Ward and Travis County went forward with a program of rejuvenating 35 to 50 miles per year. The project was let to bid with a tight set of specifications, as the county knew what it wanted to achieve.

Any remedial hot pour rubber crackfilling work was to be done four to eight weeks ahead of the application. In 2008 the program was in its third year. Work is performed during June to August, when ambient temperatures are 65 to 85 deg F (18 to 30 deg C).

The rejuvenating emulsion is applied at application rates of 0.07 to 0.08 gallons per square yard, diluted 2 parts product to 1 part water (0.32 to 0.36 liters/sq. meter). A washed concrete sand is used as a blotter at a rate of 1 to 2 lbs. per sq. yard (0.45 to 0.90 kg/sq. meter). The sand blots any rejuvenator that has not fully penetrated the surface. The rejuvenating emulsion breaks or cures in about 40 minutes.

Typically two to three streets are done at the same time, half of the road per application. Traffic control is maintained by the contractor. Door knockers are used to advise residents several days ahead of the application, and to-date there has been a 95 percent success rate in clearing the streets of vehicles prior to application.

The subdivision streets are vacuum-swept in 24 to 48 hours after application. A bonus is that because the rejuvenator does not contain asphalt, coal tar base or gilsonite, any tracking is kept to a minimum with little or no residential complaints.

Factual examples of core data testing are shown in the accompanying table.

Travis County and Pavement Restoration, Inc. have led by example and are showing other Texas municipal agencies their method of extending pavement life at a low cost.

Travis County, Texas
Top 3/8-inch of Core Samples

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Barton Point Drive			
Before	16.0	17.3	24
After	13.0	14.1	27
Bent Bow Drive			
Before	89.0	128	11
After	46.0	78.5	15
Crystal Mountain			
Before	21.0	35.9	21
After	8.98	10.5	31
Green Emerald			
Before	298	355	6
After	16.5	22.6	24
Grimes Ranch Road			
Before	44.0	60.0	15
After	12.4	42.0	28
Kratzman Drive			
Before	28.0	54.0	19
After	9.60	13.2	32
Scull Creek Drive			
Before	37.5	50.0	17
After	9.89	14.3	32
Summer Court			
Before	97.5	106	10
After	55.5	76.0	14
Wavecrest Blvd			
Before	82.0	137	11
After	13.9	15.0	27
Westminister Glen			
Before	54.2	86.4	14
After	37.8	79.9	17
Winchester Road			
Before	118	164	10
After	14.3	19.9	26
Yarrow Court			
Before	68.0	85.2	12
After	19.0	22.0	23

On Travis County, Tex., pavements, the top three-eighths inch of each core was removed for testing. The asphalt was extracted and recovered as prescribed by California Test Method 365 (CTM 365). Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph.

VALUE ENGINEERING

SUBJECT: Report on Reclamite Usage,
Naval Weapons Center
China Lake, Calif.

LOWEST COST
VERSUS
FUNCTION

DEPARTMENT OF THE NAVY
WESTERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
SAN BRUNO, CALIFORNIA 94066

NAVSO 5216/5 (REV. 11-67)
S/N 0104-904-1762 (REV. 11-67)

DEPARTMENT OF THE NAVY

Memorandum

04B:RE:nd

DATE: August 28,1973

FROM : Special Assistant for Value Engineering, Western Division, Naval Facilities Engineering Command, San Bruno, California 94066

TO : Distribution List

SUBJ : Report on Reclamite Usage, Naval Weapons Center, China Lake, California

REF: (a) Naval Civil Engineering Laboratory, Port Hueneme, California Technical Report R-690 of August 1960, by D. F. Griffin, title: Reclamite As A Life Extender for Asphaltic Concrete Pavements

1. Mr. Bruno J. Pannuto, Civil Branch, Engineering Division, Department of Public Works, Naval Weapons Center, China Lake, California (Code 7036), made and prepared the subject report and study. He was assisted in the gathering of data for this report by the following:

a. Mr. William L.Reed, Soils Laboratory Technician, Naval Weapons Center, China Lake, California (Code 7036), assisted in conducting the field tests.

b. Code L-53 of the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, California, performed the viscosity tests on the pavement cores extracted from the test sections.

2. Technical Report R-690 description, NCEL Guide to Technical Documents, reference (a), reads as follows:

> Reclamite, a proprietary product, is described, including its makeup, usefulness, and limitations. Reclamite is said to be a fine-particle-size, cationic, oil-in-water emulsion of a selected blend of the four principal fractions of maltenes. When used properly it is effective in maintaining the service life of an asphaltic concrete pavement. It is also effective in rejuvenating weathered asphalt. This effectiveness has been verified with consultation with such users of reclamite as federal, state, and county agencies. Some of these users have employed reclamite for 10 years. Prospective users should avail themselves of the consultative services offered by the manufacturers.

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Subject: Report on Reclamite Usage, Naval Weapons Center, China Lake, California

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INTRODUCTION

The data and observations given in this report were compiled in an effort to determine the effect, beneficial or otherwise, of Reclamite on asphalt concrete pavement.

Reclamite is a proprietary product manufactured by the Golden Bear Division of Witco Chemical Corporation at the Golden Bear refinery, located in Bakersfield, California, at Manor Street and Norris Road, telephone: 805-399-9501.

Asphalt, as defined by the American Society for Testing and Materials (ASTM), is a dark brown to black cementitious material in which the predominating constituents are bitumens, which occur in nature or are obtained in petroleum processing.

It is generally accepted that bitumen is composed of two main fractions, asphaltenes and maltenes. The maltenes, in turn, are composed of subfractions, the principal ones being: (1) nitrogen bases (N); (2) first acidaffins (A_1); (3) second acidaffins (A_2); (4) paraffins (P). The manufacturer of Reclamite claims the influence of maltenes on the durability of asphalt as a cementing agent depends on the ratio of the above four subfractions of the maltenes. The parameter, $\frac{N + A_1}{P + A_2}$ which defines this ratio, was used to develop the product Reclamite.

As defined by the manufacturer, Reclamite is an emulsion of carefully selected high-quality petroleum oils and resins, designed to penetrate dry and weathered asphalt pavements, giving them new vitality and plasticity. It contains ingredients which make for deep, rapid penetration and cause it to seek the asphalt in the pavement in preference to the aggregate. The manufacturer also claims that because of this Reclamite combines with the asphalt so as to restore its original desirable properties and in some cases even improves over the original because of the better quality of the added components.

It therefore becomes quite obvious and logical that should these claims be correct then Reclamite would be a very desirable and necessary link in the preventive maintenance process. This brings us to the basis and motivation for the test sections made and consequently this report of the results obtained. There had developed a definite need to establish the actual benefits that could be derived from the use of this product here at the Naval Weapons Center as well as similar areas and localities experiencing little rain, low moisture, and high summer temperatures. A typical summer temperature chart showing comparison between pavement surface and air temperatures experienced in the test area is shown at the end of this report as Plate 7. It seemed that the only reliable way to determine these benefits was by way of actual test sections laid out on representative roads in the area. The test section shown in Figure 1 (Page 2) is typical of that used on each of the three roads covered in this report. It was originally planned to include two other roads in this report, but the reliability of these test sections was too doubtful to be useful.

This test program commenced with the seal coating of the three roads as part of a current road repair contract under construction at the time. The test sections were marked on the pavement with paint and carefully controlled during the spraying operation in order to maintain the integrity of the section. Periodic inspections

were then scheduled at four-month intervals beginning in April 1969 and terminating August 1970. These inspections consisted of extracting core samples for the purpose of determining the penetration value of the treated and untreated asphalt, some field measurements, and a close visual inspection, which included actual size photographs. The core samples were sent to the Naval Civil Engineering Laboratory, Port Hueneme, where viscosity tests were made on the extracted asphalt, and, with the aid of a chart, these viscosities were correlated with penetration values. The assistance from NCEL was made possible through Mr. Harold W. Webster, who at the time was the RDT&E (Liaison) Engineer, Code 09P, Western Division, Naval Facilities Engineering Command. Since our lab lacks the sophisticated equipment necessary for performing the viscosity test, we were delighted to take advantage of the laboratory facilities so generously made available at Port Hueneme.

Two of the three roads tested were ideally suited for testing since the pavement was laid in one pass (full width), thus providing identical pavement conditions for each lane. The third road (Pole Line Road) was not laid in one pass and each lane was put down in a separate lay-down operation. As a result, the pavement characteristics of the opposite lanes of the Pole Line Road were not similar to each other as were those for the single pass roads. The difference could be detected visually and was also apparent from results of field tests made on the different lanes prior to the application of the Reclamite. This discrepancy was minimized by prorating one lane with the other as was noted in Plate 4, at end of report, and which should be kept in mind in evaluating the penetration values in Plate 3. Prorating was not done in Plate 3 since no core samples were taken prior to the Reclamite application.

Three cores were taken from each test section and numbered. The highest number represents the core taken one foot in from the edge of the road (Reclamite side); the next highest number represents the core taken three feet in from the edge of the road (Reclamite side); the smallest numbered core was taken three feet in from the edge of the road on the control (untreated) side. This same number system was maintained in Plates 1, 3 and 5 as an aid to the viewer; a number system was not necessary in Plates 2, 4 and 6. All plates are grouped together for ease in comparison and are located at the back of this report.

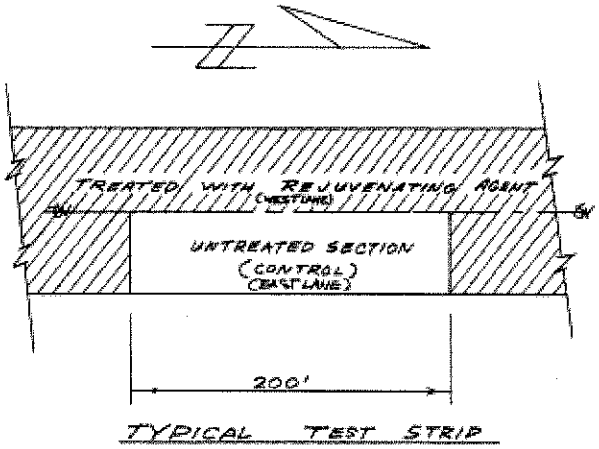


Figure 1

DISCUSSION

In order to evaluate the merits and beneficial aspects of a rejuvenator for asphalt pavement, it would seem apropos at this time to discuss the causes of pavement distress and deterioration leading to pavement failure.

It is fact that the properties and characteristics of asphalt in pavements age or change in composition with time. The degree and rate of this deterioration are different with each paving mixture laid and depend largely on the chemical composition, climatic conditions and the actual age of the pavement. This aging reveals itself in the form of brittleness, which leads to the loss of fines (pitting) and raveling, and then to shrinkage cracks and spalling of the pavement.

Another type of pavement failure is due to poor base and is remedied by replacement of the base material. This type of repair usually falls into the category of major repair and, of course, is beyond the healing effects of a rejuvenator.

As was previously indicated, Reclamite is primarily used as a preventive maintenance tool. The chief benefits of Reclamite rest in its ability to restore life or plasticity to aged pavement as well as to retard the aging process. The whole purpose then of the test sections, and consequently this report, is to determine the extent of Reclamite's ability to do this. The principal indicator used for this purpose was the penetration values derived from viscosity tests (Sliding Plate Micro-Viscosity Test) performed on the core samples, and the plots of these values are shown in Plates 1, 3 and 5. These tests were conducted at the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, by their Soils and Pavement Department, Code L-53. In addition to the viscosity tests, some field measurements were made which included a penetration value of sorts using the Airfield Cone Penetrometer apparatus, laboratory-made photographs, special photographs, pavement surface temperatures, and close visual inspections. Measurements between sets of surveyors' "PK" tacks placed on either side of pavement cracks were taken in an attempt to observe movement, but these measurements proved completely nonconclusive.

Field data received from the Airfield Cone Penetrometer was obtained by recording the pressure required to penetrate the asphalt in the pavement ⅛" with the cone tip of the penetrometer. This procedure was repeated three to four times and then the average of these values was recorded and plotted against temperature. The plots of these curves are shown in Plates 2, 4 and 6.

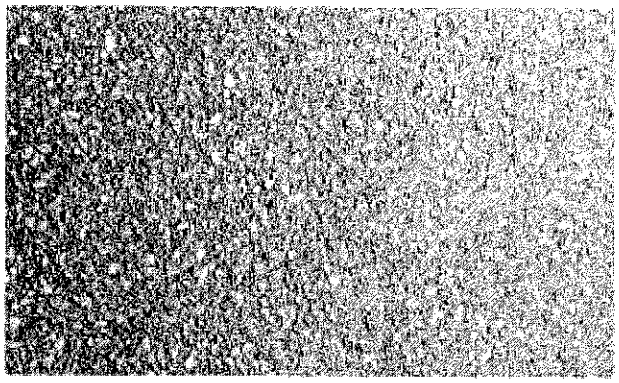
A Polaroid camera was used to substantiate the visual observations made with each field inspection. In addition to "Special Pictures," which are included because they show a special effect or dramatically illustrate the effects of Reclamite, there was established a systematic series of photos taken at specific locations. Each location was marked by a "PK" tack within a painted circle in order to provide a common comparison point among field inspections.

The first of the three roads covered in this report is G-2 Tower Road. This road received a one-inch (1") asphalt concrete overlay in April 1967 and a tenth of a gallon per square yard (0.10 G/sy) application of Reclamite in July 1969 (27 months later). The overlay was laid in a single pass, full width, thus

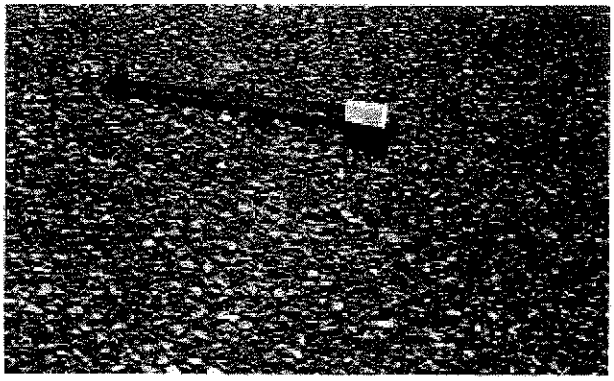
guaranteeing a uniform pavement texture for both lanes—perfect for comparison purposes. The first field inspection in this case was made three months prior to the Reclamite application and provided the opportunity to inspect and record the deterioration rate of the pavement prior to treating with Reclamite.

Photographs of G-2 Tower Road taken during the regular field inspections are shown on pages 5 and 6, with the Special Pictures following on page 7. To avoid confusion, Special Pictures will be described as "special pictures" when reference is made to them in this report and listed as such at the bottom of the page where they are shown; otherwise, it should be understood that the referenced pictures are photographs taken at the regular scheduled field inspections. Photographs taken October 1968 and April 1969 illustrate the similar pavement conditions existing within the test section. It was not until 5 months after treatment that a noticeable difference in pavement texture was becoming apparent and manifested itself by small "pock" marks appearing in the control section. Pock marks are caused by the loss of surface aggregate from the asphalt pavement. A shadow was cast across the December 1969 photograph (control) in an attempt to make these pock marks more visible. Special pictures, December 1969, shown on page 7, were taken under overcast skies, of both the control section and the Reclamite section, for the sole purpose of illustrating this phenomenon. From December 1969 on, the difference in pavement texture becomes more evident, as can be noted from the photographs. Special Picture August 1970 (13 months after Reclamiting) gives the viewer an impressive look at the beginning of the test section, illustrating the difference in pavement textures. Special Picture April 1971 (21 months after Reclamiting) was taken after a light rain and helps demonstrate the sealing effect achieved. The control (untreated) section in this photo is quite discernible because it had remained wet long after the remainder of the pavement dried. Pictures of two of the three sets of pavement cores are shown on pages 8 through 11. The two cores shown (one from the control side, the other from the treated side) were taken at equal distances from the edge of the pavement. The two sets of cores taken from the Reclamite-treated section (one foot and three feet from the edge) were virtually the same due to the fact that the width, speed and layout of the road are such that no definite wheel pattern could be established; therefore only one of the Reclamite cores is shown here.

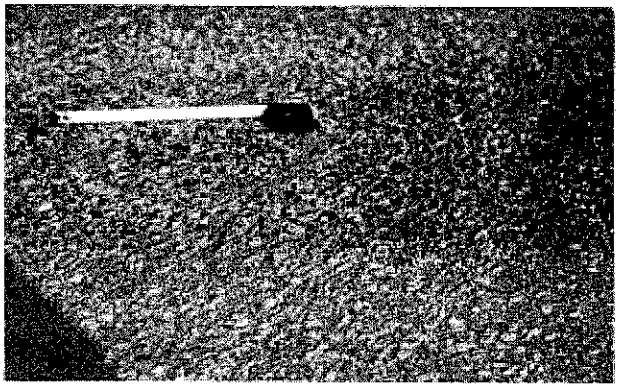
When inspecting the pictures of the core samples, it would be well to bear in mind that these pictures were made at approximately the same time the core samples were extracted from the pavement, which was at four-month intervals. Therefore a slight difference in the lighting and shading effects for each set of pictures will be noticed and should be accounted for in comparing pictures taken at different dates. The numbering system used to identify the core pictures is as follows: the first of the three numbers used for each picture is the core number assigned to a specific location, and this number is the same for all cores extracted from that location; the remaining two numbers indicate the month and year that the core was extracted. For example, Core No. 12 taken from the Control Section of G-2 Tower Road in August 1969 will be identified as "12-8-69, G-2 Tower Road—Control."



October, 1968—1"Overlay, Age 18 Months.

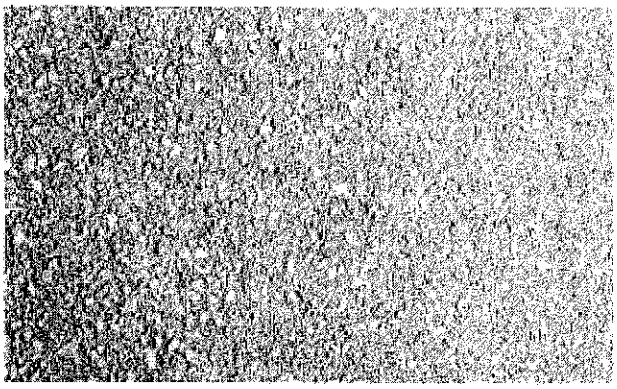


April, 1969—Age 24 Months.



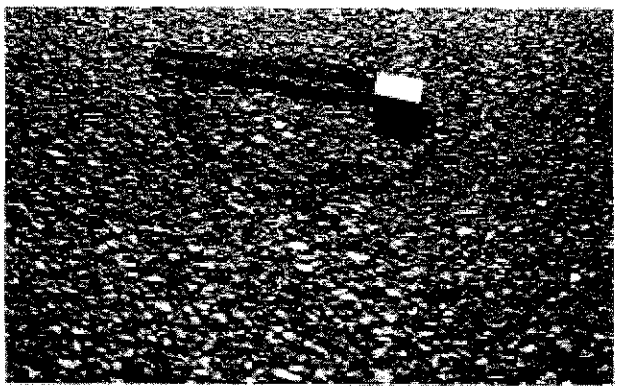
August, 1969—Age 28 Months.

G-2 TOWER ROAD
Control Section
(Untreated)



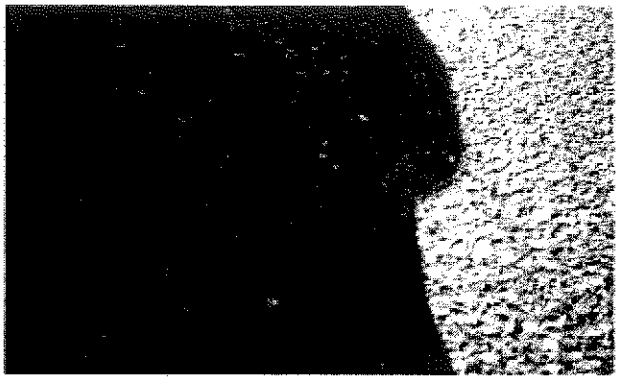
October, 1968—1"Overlay, Age 18 Months.

April, 1969—Age 24 Months, Prior to Reclamite.

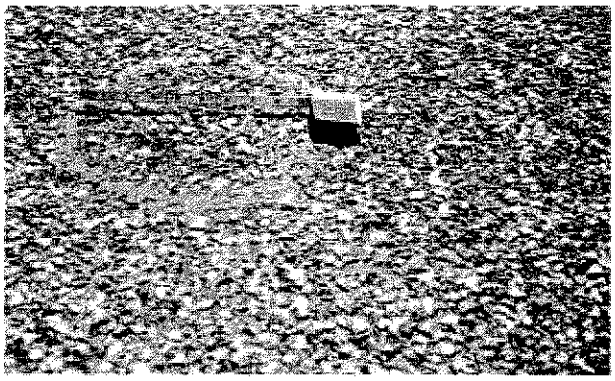


August, 1969—1 Month after Reclamite.

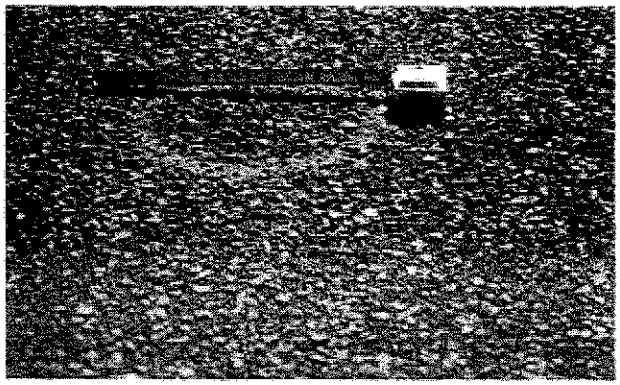
G-2 TOWER ROAD
Test Section
(Treated)



December, 1969—Age 32 Months.

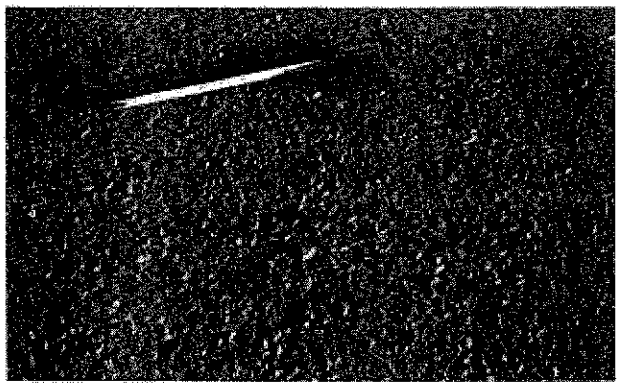


April, 1970—Age 36 Months.

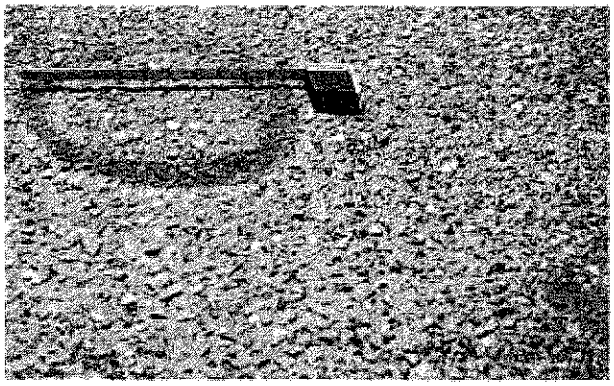


August, 1970—Age 40 Months.

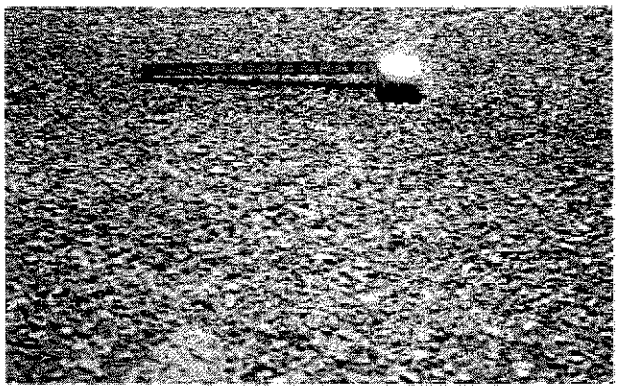
G-2 TOWER ROAD
Control Section
(Untreated)



December, 1969—5 Months after Reclamite.

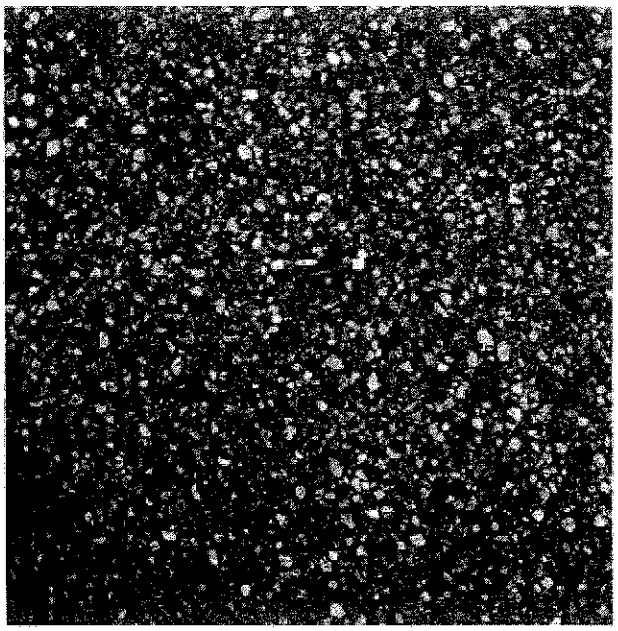


April, 1970—9 Months after Reclamite.

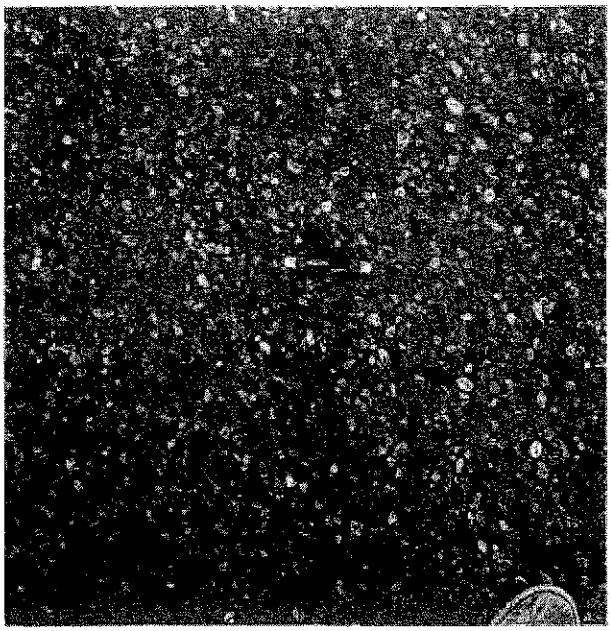


August, 1970—13 Months after Reclamite.

G-2 TOWER ROAD
Test Section
(Treated)

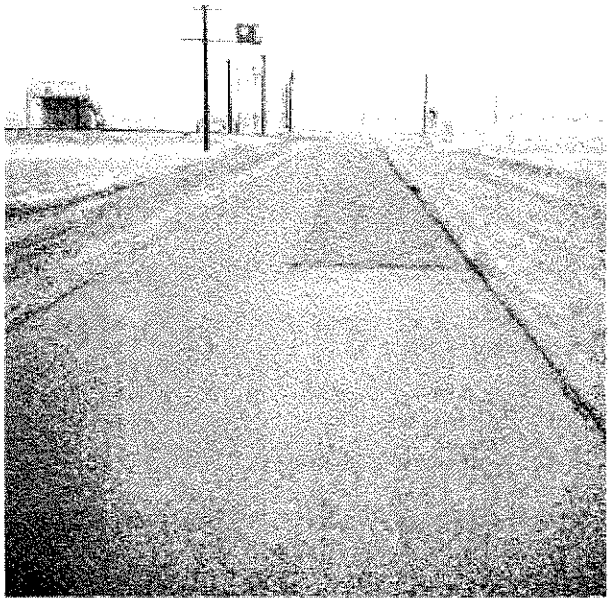


December, 1969—Age 32 Months; Untreated.



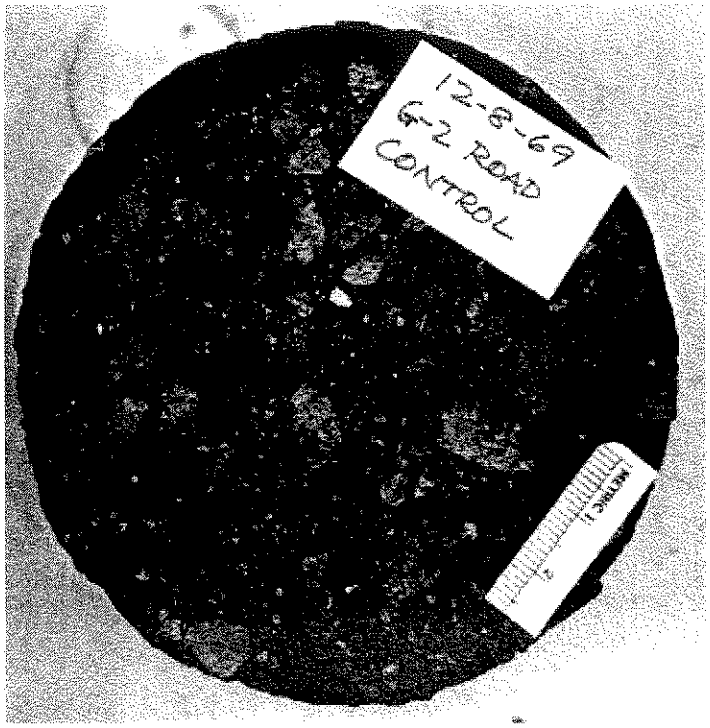
December, 1969—5 Months after Reclamite Treatment.

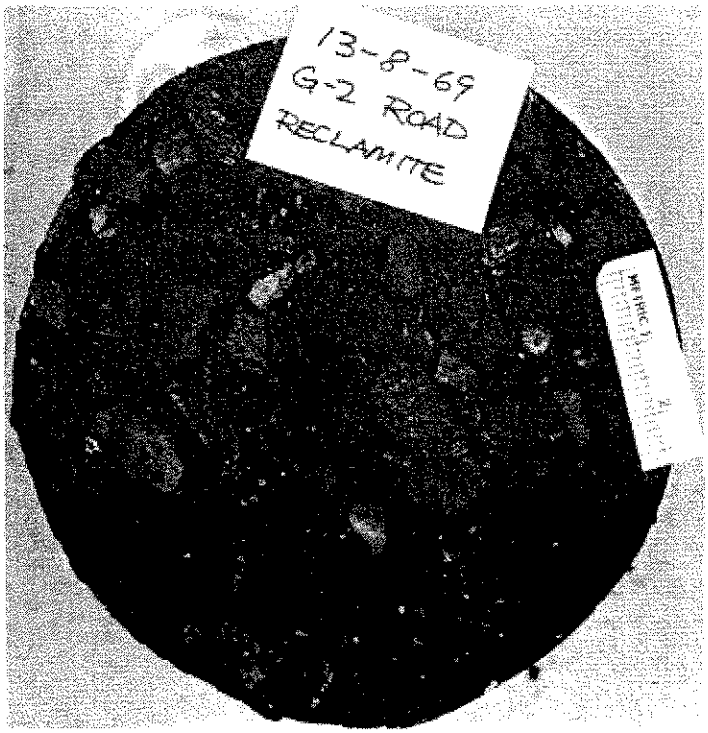
August, 1970—13 Months after Reclamite Treatment.



April, 1971—21 Months after Reclamite Treatment. (2 Hours after Rain)

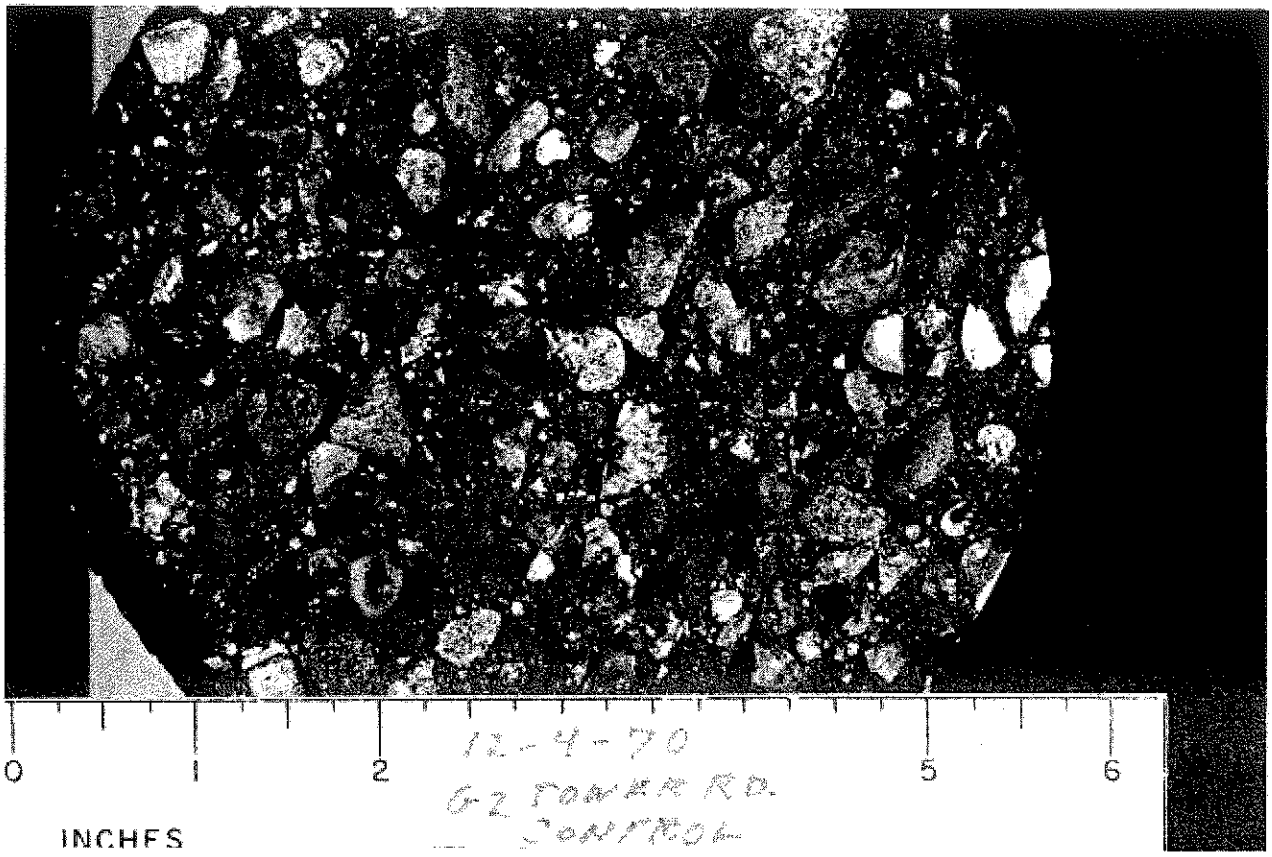
G-2 TOWER ROAD
Special Pictures

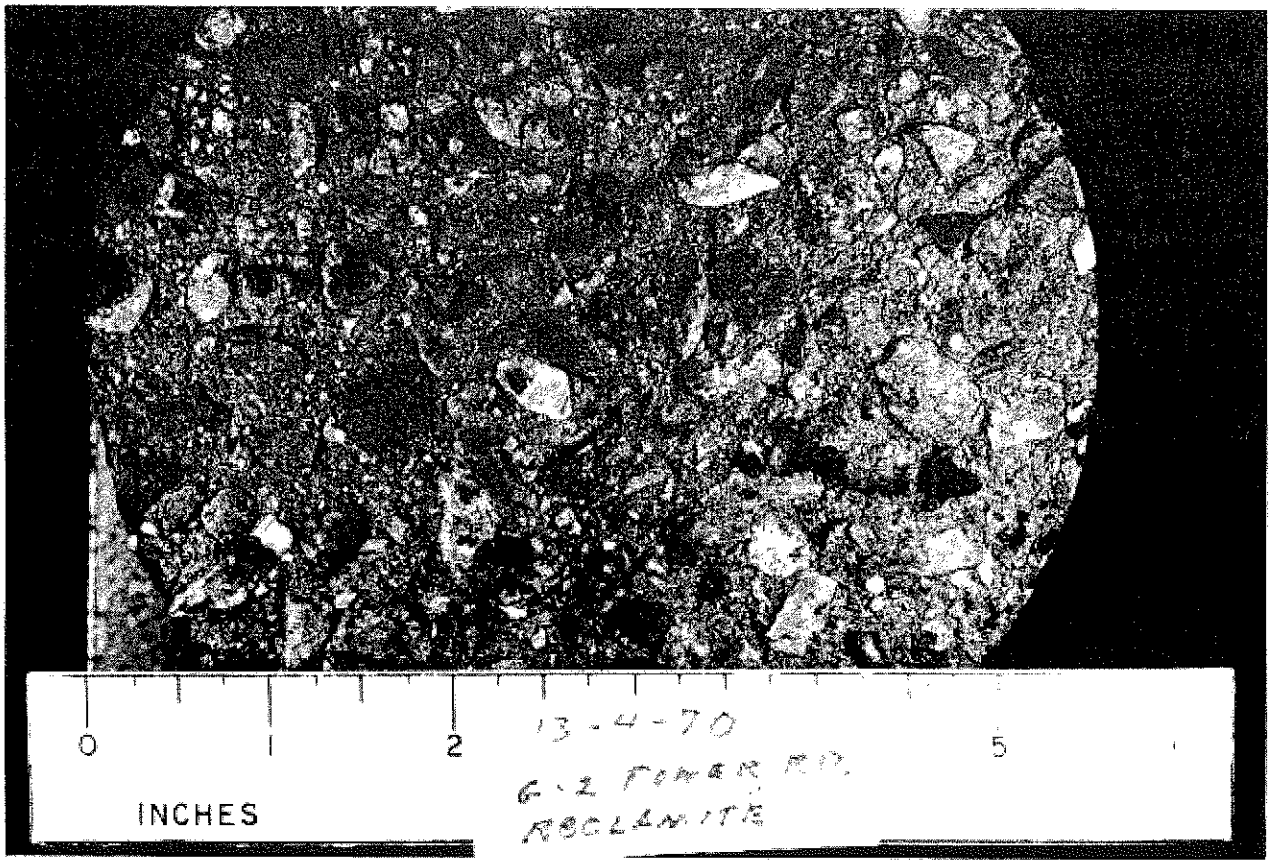




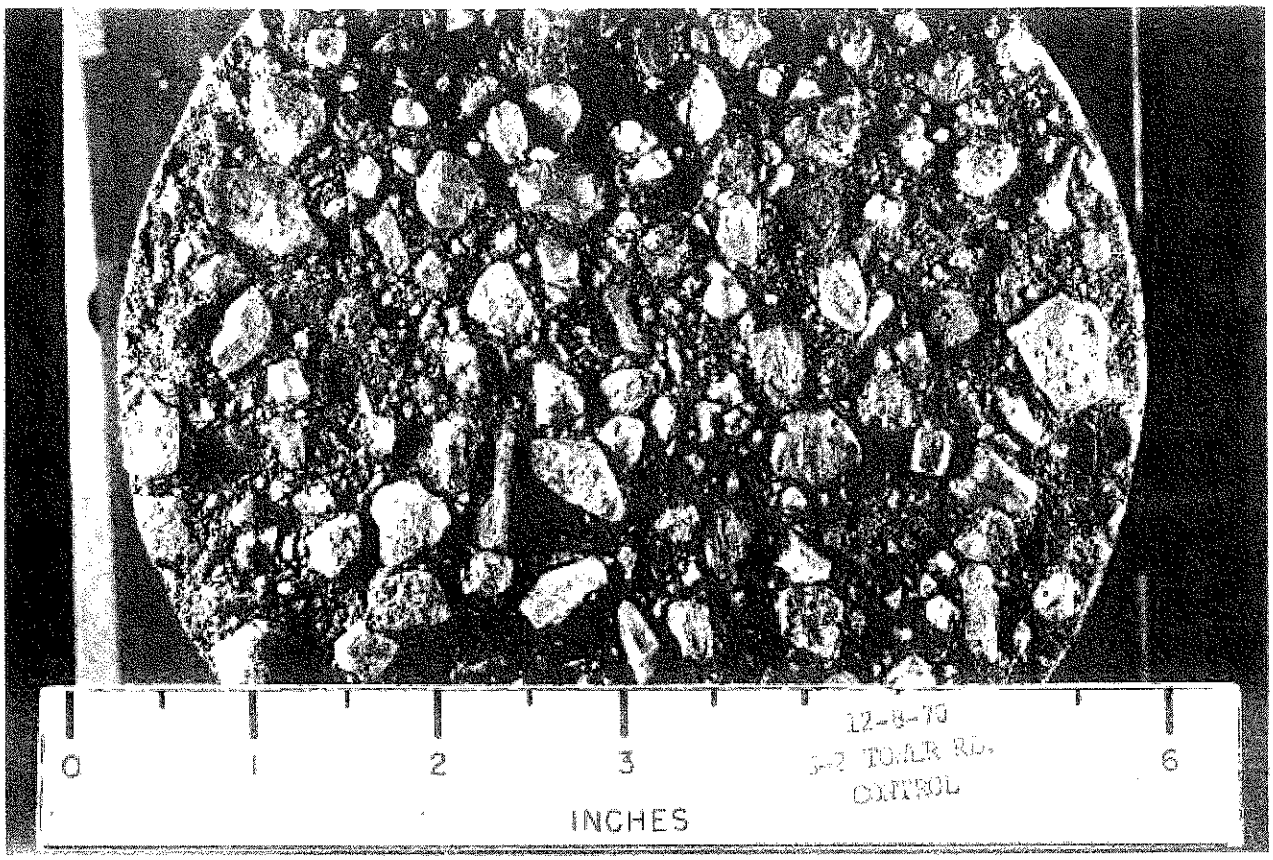
G-2 TOWER ROAD

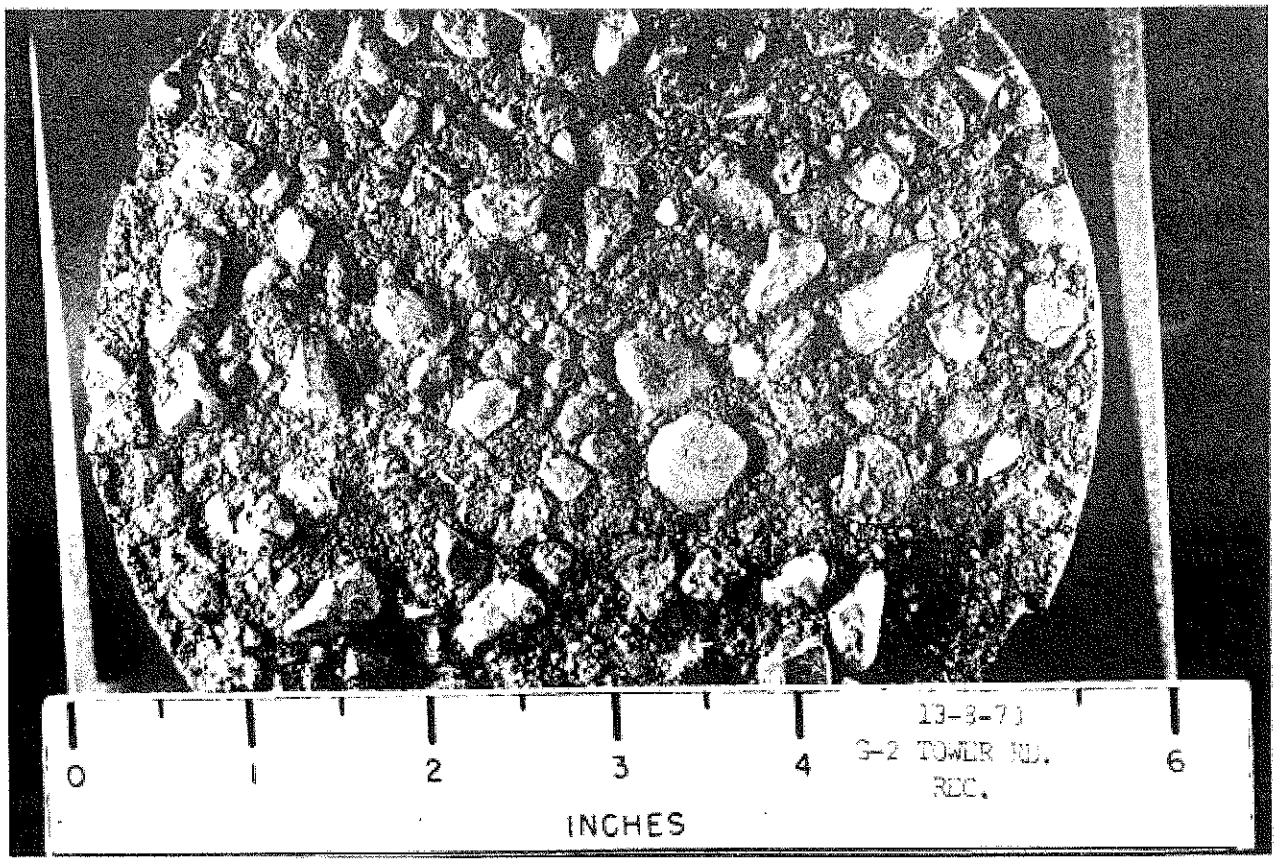
G-2 TOWER ROAD





G-2 TOWER ROAD





G-2 TOWER ROAD

The plots of the peneration values obtained from the viscosities of the cores were also given the same identifying number as that of the corresponding core sample. For example, Plate 1, plots number 12A and B pertain to core number 12.

The above numbering and identifying system is used throughout this report.

The results of the viscosity tests made on these core samples taken from G-2 Tower Road are plotted in Plate 1 and show an extraordinary difference in the penetration values. It is interesting to note that the plots of the penetration values for ½"-1" portion of the Reclamite cores increase with time, while those of the Control Section decline. Another interesting point to note is that the increase in penetration values for the top ¼" occurred with the first set of cores taken only one month after treatment, thus indicating that the full effects of Reclamite for the top ¼" take place within the first month while those of the ½"-1" layer increase with time for at least the first year. Another observation to note is that the penetration values of the control section for the top ¼" are, as would be expected, lower than for the ½"-1" layer, while just the opposite is true for the Reclamite cores.

Moving to Plate 2, we have the results of the Cone Penetrometer test performed in the field. As the values for the abscissa approach zero, the difference in temperature (ordinate) values becomes less meaningful and so a semi-log scale was used. As the curves indicate, the values for the treated pavement section show softer asphalt than that of the control section, thus indicating the oxidation process has been radically decreased; in fact, reversed.

The second road covered in this report is Pole Line Road. The history of this road as pertains to this report is as follows: It received a 2" overlay in April 1967 and in mid-year of 1969 was treated with Reclamite (0.15 G/sy), at which time the test sections were laid out. In the first field inspection (April 1969), which was prior to treatment, it was observed and noted that the west lane had a more pitted appearance than the east lane. The fact that the road was laid in two passes is the only obvious reason for this difference in surface texture, which is probably the result of a slight difference in the mix used for each lane. This difference was also apparent in field tests made with the Cone Penetrometer before treating the pavement with Reclamite. These tests revealed that, although the two lanes were put down at the same time, under the same specifications, and supposedly the same mix, the values for the two lanes were quite different, as is illustrated in Plate 4. The east lane averaged 14 pounds to penetrate ⅛" while the west lane averaged 20 pounds. As a result, an adjustment was applied to one of the curves in Plate 4 to compensate for this difference and more nearly bring both lanes to an equal comparative basis.

A more accurate comparison of treated versus untreated pavement would be to confine inspection and evaluation of pavement texture, etc., to the one lane only, since this way we would be sure of the pavement equality prior to treatment. This was, to some degree, accomplished in Plate 4 by prorating the values of the control section. It was not possible, however, to apply this prorating process to the

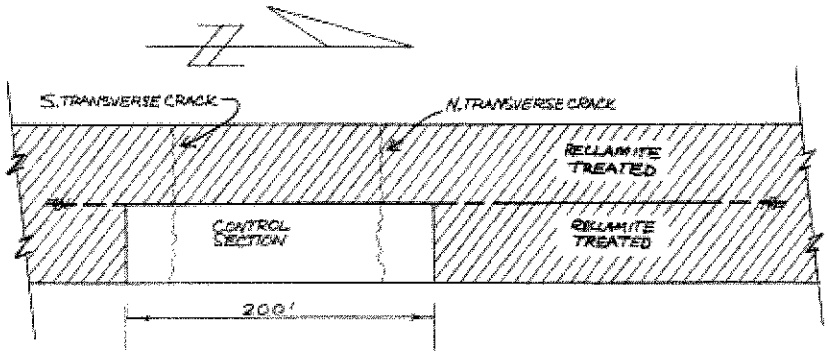
penetration values in Plate 3, since no cores were taken prior to treatment so as to set up a basis for comparison.

When viewing the photos of Pole Line Road (pages 15 through 17), it becomes apparent that the treated portion of the test section eventually approached the same surface texture as that of the control section rather than showing an improved surface. However, the fact that the treated pavement showed a poorer texture prior to treatment and now, after treatment, looks more equal to the control section, does indicate that treatment did indeed halt the drying and oxidation process. The special pictures, August 1970 and April 1971 (on page 17), illustrate clearly the similarity between the control section and the west (treated) lane while showing a definite contrast within the east lane itself between its control section and the treated portion. In special picture, April 1971 (taken, incidentally, after a light rain), the viewer can easily pick out the point at which the nozzles were turned off at the beginning of the section despite the fact it missed the marked-on-payment begin lines.

Plate 3, which plots the results of the penetration values obtained from the extracted core samples, shows a smaller increase in the treated over the untreated pavement than the other two roads in this report (Plates 1 and 5). This is, however, understandable and somewhat expected since the pavements in each lane of this test section are not identical. The condition of the west lane prior to being treated may be the reason for its comparatively lower penetration values. The pictures of the core samples are shown on pages 18 through 21. Again it is well to bear in mind when viewing these pictures, produced in our Naval Weapons Center Photo Lab, that the shading effects differ slightly between each set of cores.

The third and last road covered in this report is called Area-L Road. This road received a 1" overlay in April 1967 and was treated with Reclamite (0.15 G/sy) in May 1969 at which time the test section was laid out. The overlay on this road was made in a full width single pass lay-down (like G-2 Tower Road) which made this road another perfect candidate for a test section.

Area-L Road provides us with the additional opportunity to observe the effects of Reclamite on pavement cracks. The following sketch shows the approximate location of two of the cracks occurring within the test section and the identification of each for the purpose of this report.



The cracks in this road are predominately transverse cracks and are spaced somewhat uniformly at approximately 25' intervals. Again, our first field inspection

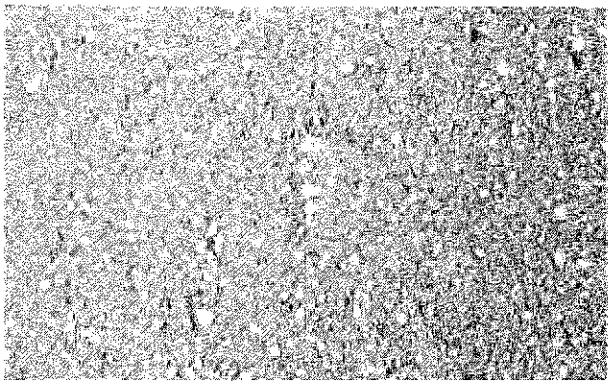
took place prior to treatment (one month in this case) and thus gave us a "Before" look at both lanes before applying the Reclamite.

In examining the photos, shown on pages 22 through 25, taken as part of the field inspection, the difference in the appearance of the cracks after being treated with the rejuvenating agent is quite impressive. It is interesting to note that practically the full benefit of the rejuvenating agent took place shortly after treatment and then continued to improve at a lesser rate. Photo August 1970 (treated side) of the south transverse crack shows the extent of improvement when compared with the April 1969 (treated side) photo taken before treatment. Comparison of photo August 1970 (control) with photo August 1970 (treated) shows the difference in crack appearance of the same transverse crack in the same pavement in the treated and control sides. A similar result was achieved with the north transverse crack, again comparing August 1970 (treated) with August 1970 (control); a marked improvement can be seen. Obviously, the softening effects of Reclamite are allowing traffic to close these cracks in a sort of kneading action.

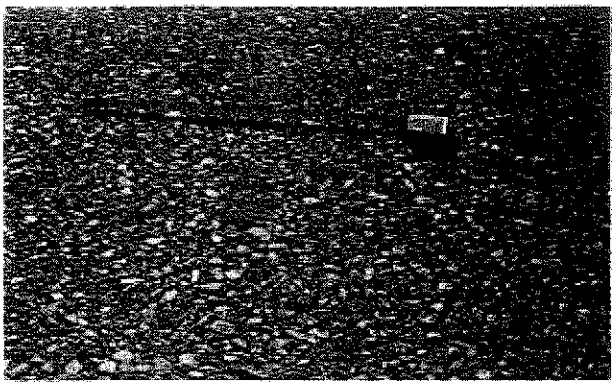
Surface texture differences between the control section pictures and those of the treated side show without doubt that the aging and oxidation process has been greatly reduced. The penetration value shown in Plate 5 gives a good indication to substantiate the improved condition of the pavement.

Special pictures pages 26 and 27, show views of Area-L Road at various angles and distances. Special pictures April 1970 and all of the April 1971 pictures were taken after a light rainstorm. While the pavement was still wet, the control section stood out due to its lack of shine, indicating the rain water was being absorbed into the surface. As the pavement was drying, the control section retained its wet look and was the last section of pavement to dry. Special pictures April 1971, page 27, show up the difference in pavement texture and give a view of a transverse crack that was filled uniformly with crack filler. A month or so later, the filler along the treated section is still effective, while on the control side it was absorbed by the crack, indicating the difference in crack size now existing for the same crack, half of which is located in the treated pavement. The special picture shown at the middle left of page 27 gives a view of the control section at a distance. The picture at the bottom right of this page shows the limit of the control section painted on the pavement. Closer inspection of this picture shows the exact line where the treated pavement ends and the control section starts, which incidentally is slightly off from the painted limit marked on the pavement. Also to be noted in this picture is the difference in the transverse crack as it goes from the control section into the treated section. The picture at the bottom left of this page (27) illustrates the effect of the rejuvenating agent on both transverse and longitudinal cracks. The longitudinal crack shown clearly along the edge of the control section continues along the treated pavement also, but turns into a hairline crack right at the start of the treated side and is difficult to see even when standing right over it. The transverse cracks viewed in this picture are also difficult to trace as they enter the treated pavement.

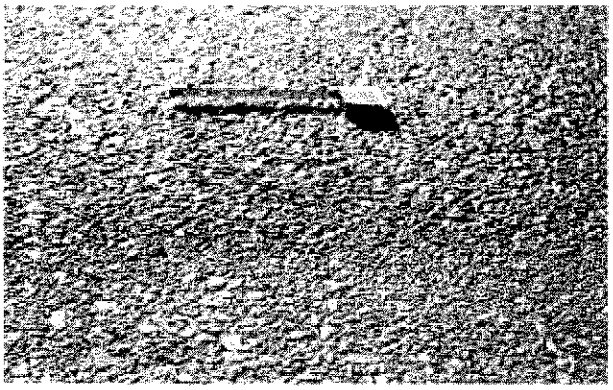
The pictures of the core samples are shown on pages 28 through 31, and complete the evaluation of this road.



October, 1968—2"Overlay, Age 18 Months.

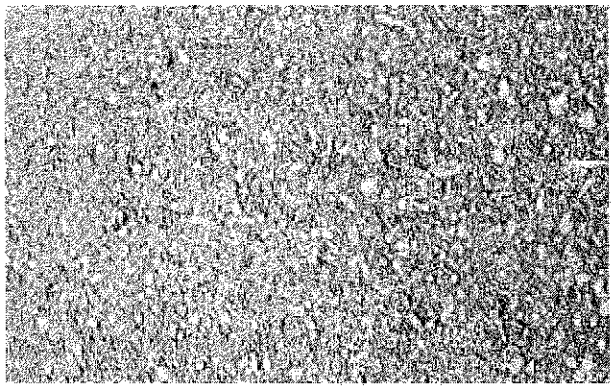


April, 1969—Age 24 Months.



August, 1969—Age 28 Months.

POLE LINE ROAD
Control Section
(Untreated)

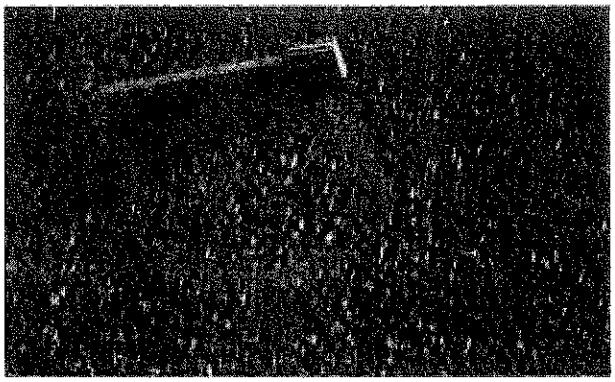


October, 1968—2"Overlay, Age 18 Months.

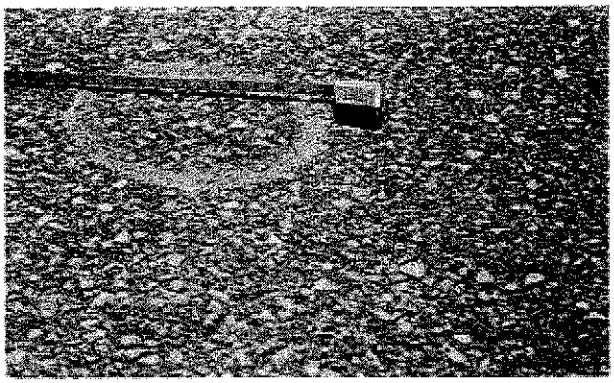
April, 1969—Age 24 Months.

August, 1969—1 Month after Reclamite.

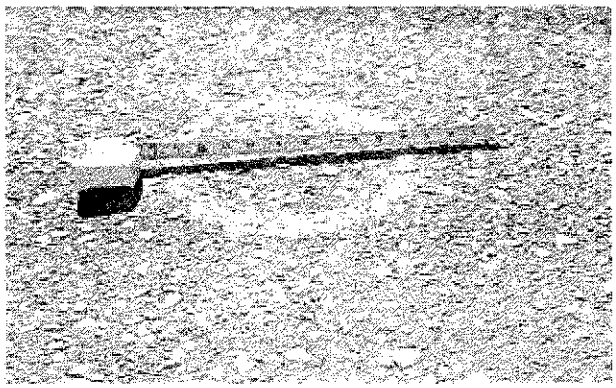
POLE LINE ROAD
Test Section
(Treated)



December, 1969—Age 32 Months.

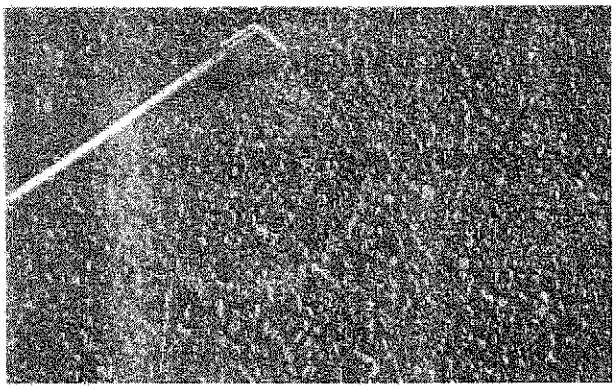


April, 1970—Age 36 Months.

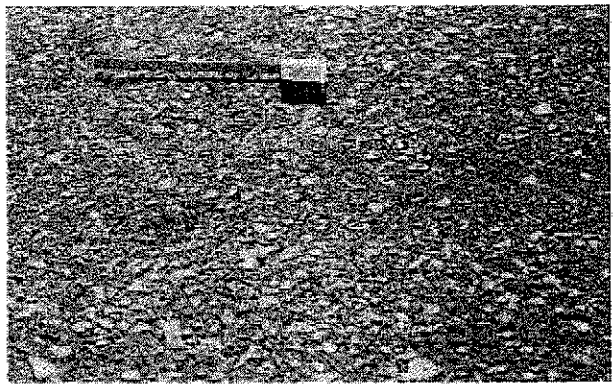


August, 1970—Age 40 Months.

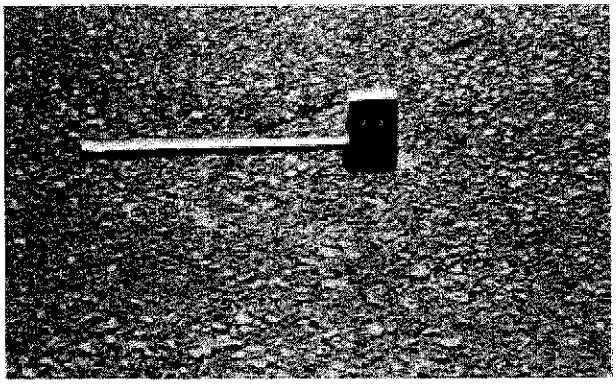
POLE LINE ROAD
Control Section
(Untreated)



December, 1969—5 Months after Reclamite.



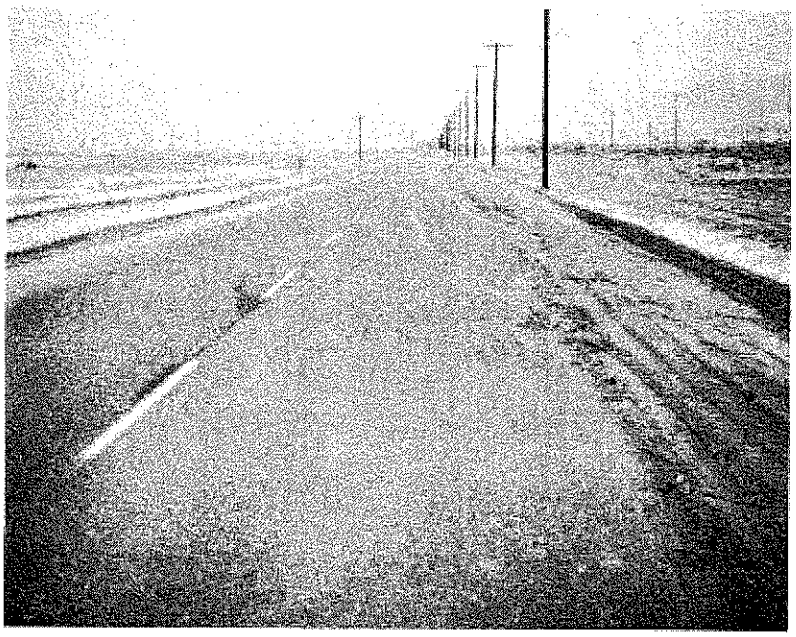
April, 1970—9 Months after Reclamite.



August, 1970—13 Months after Reclamite.

POLE LINE ROAD
Test Section
(Treated)

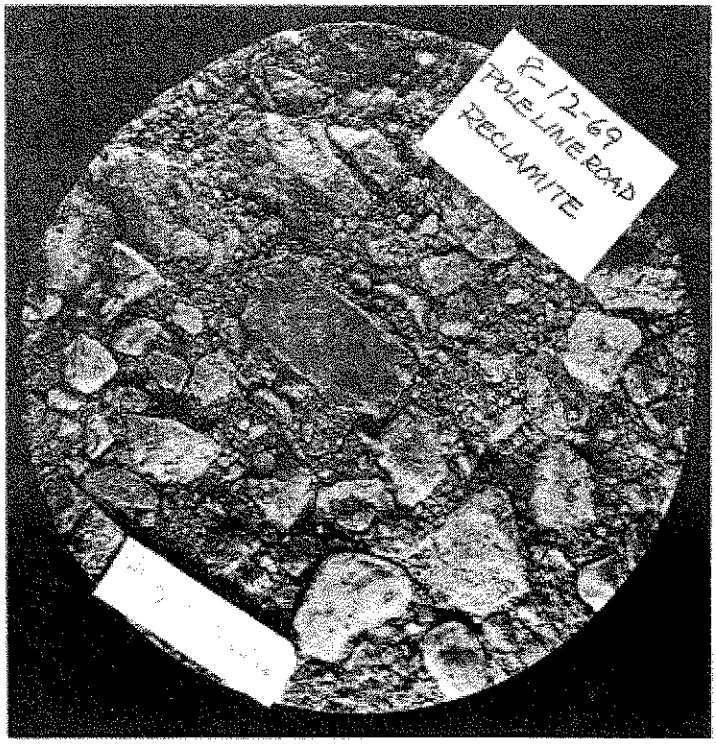
August, 1970—13 Months after Treatment.



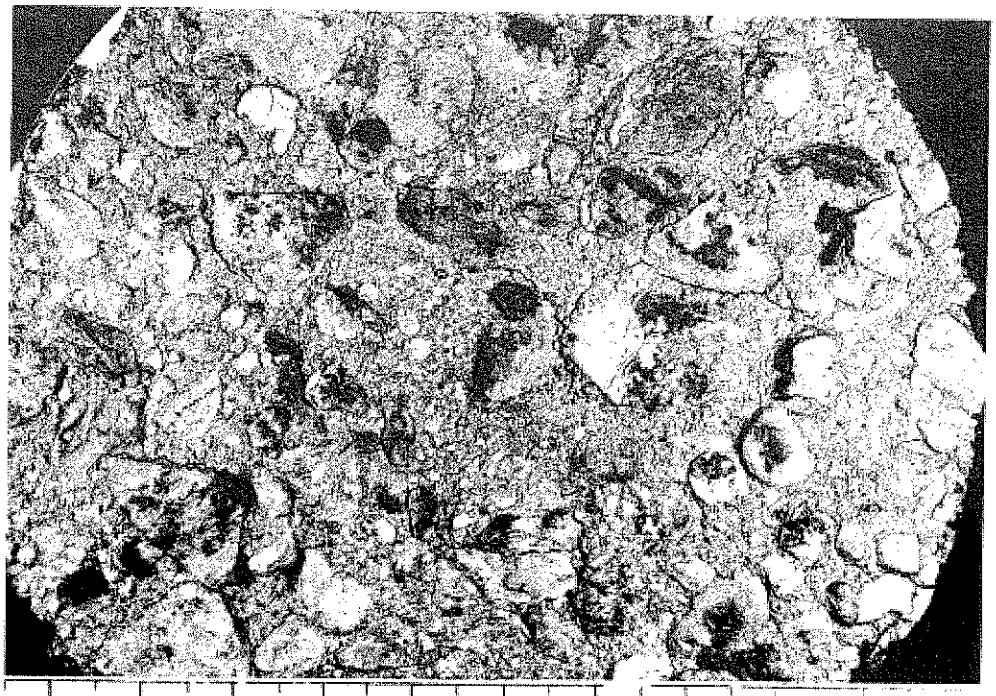
April, 1971—21 Months after Reclamite.
(Approximately 1½ Hours after a Light Rain).

POLE LINE ROAD
Special Pictures

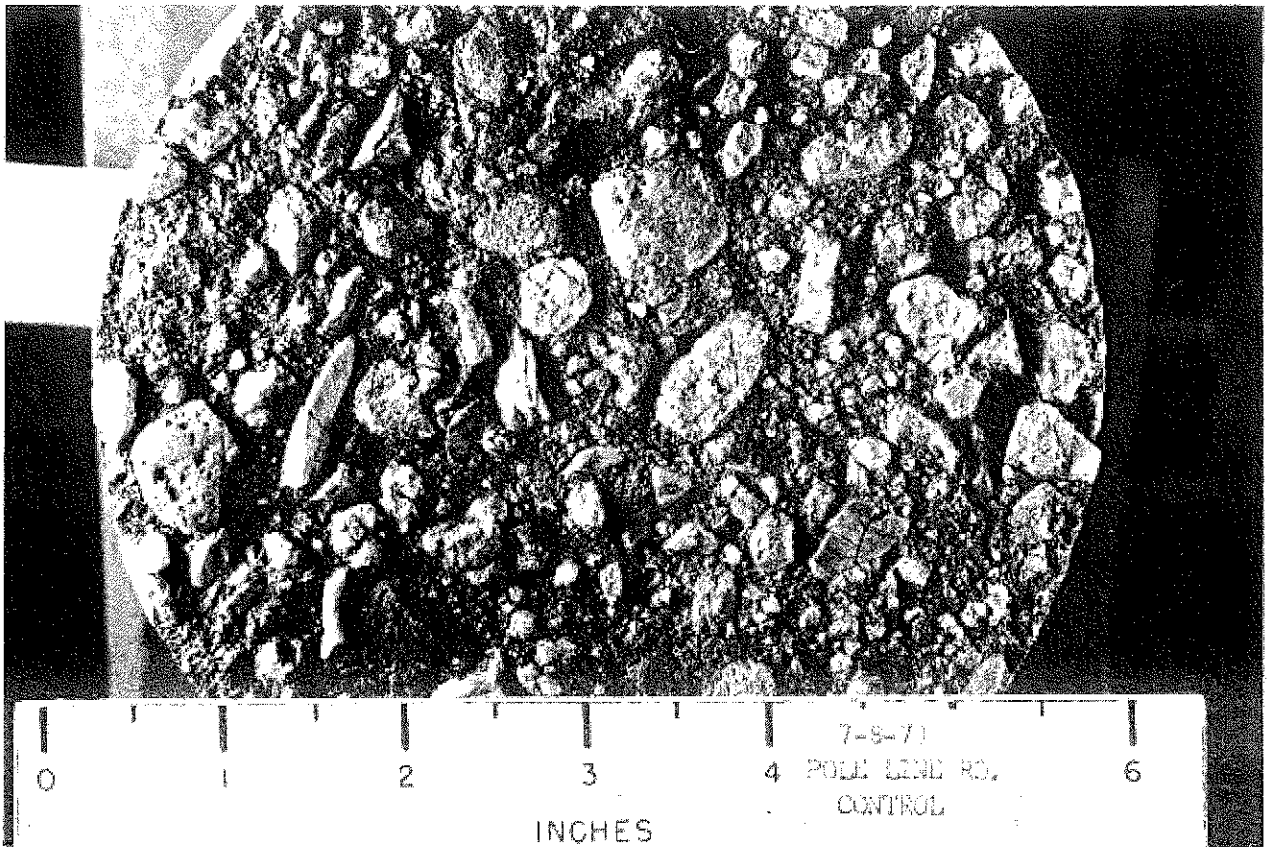
POLE LINE ROAD

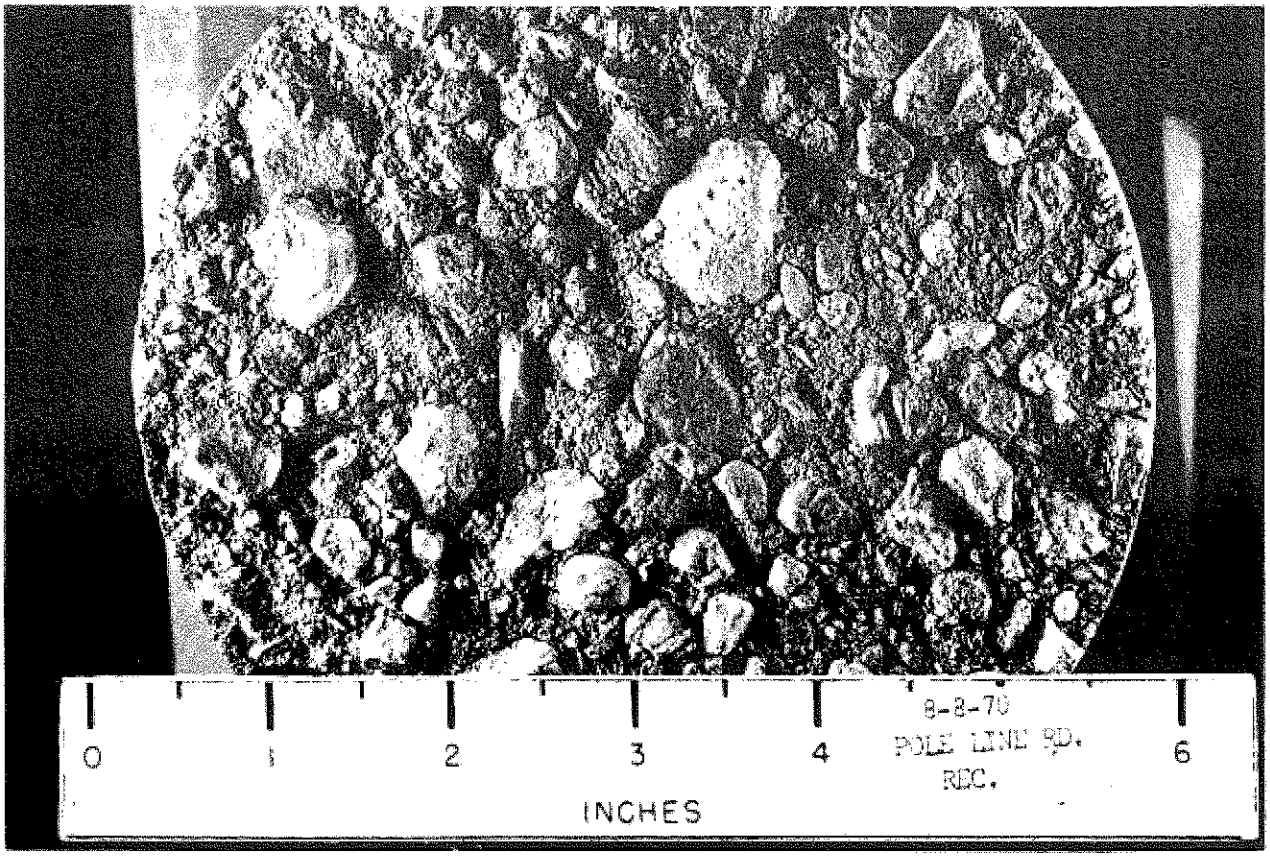


POLE LINE ROAD

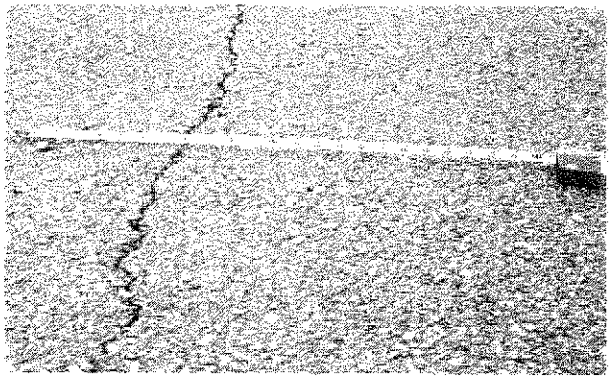


POLE LINE ROAD



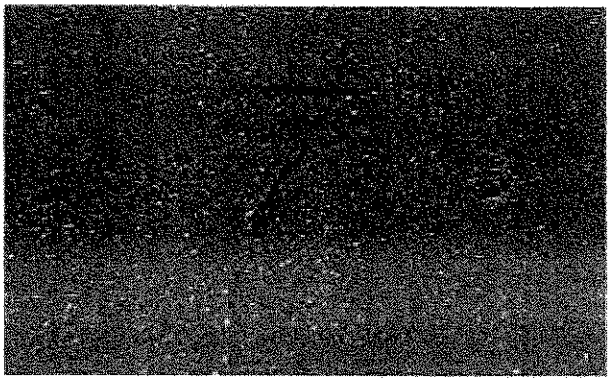


POLE LINE ROAD



April, 1969—Age 24 Months.

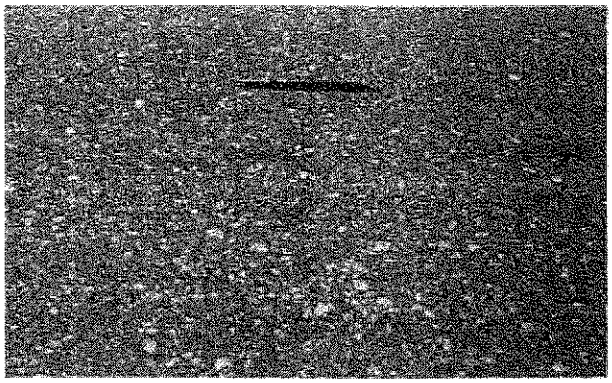
August, 1969—Age 28 Months.



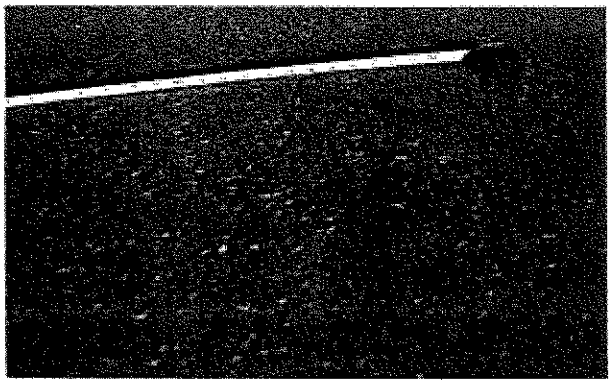
December, 1969—Age 32 Months.

AREA L ROAD
Control Section
(Untreated)
South Transverse Crack.

April, 1969—Age 24 Months.

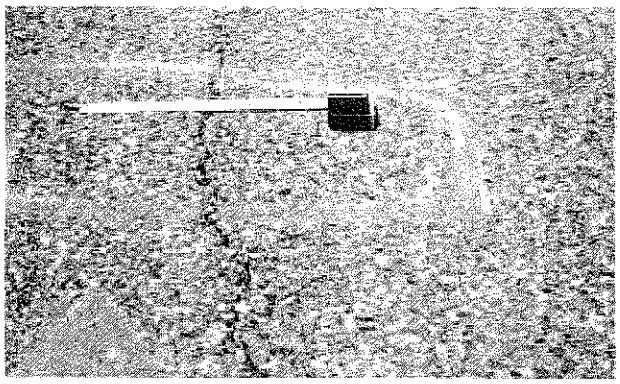


August, 1969—3 Months after Reclamite.

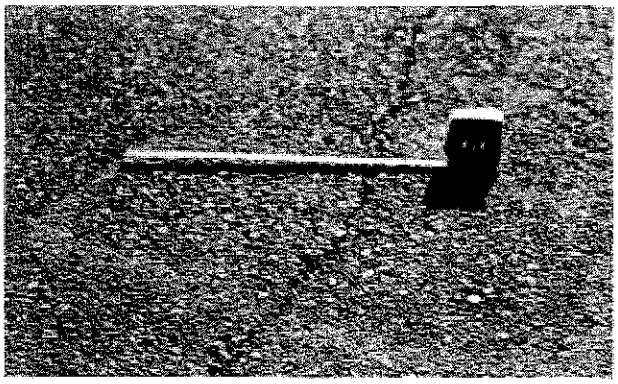


December, 1969—7 Months after Reclamite.

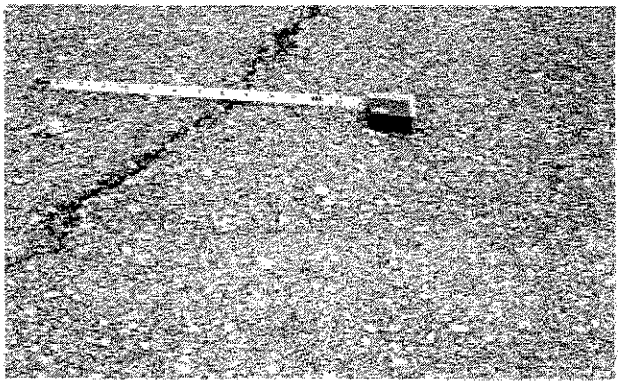
AREA L ROAD
Test Section
(Treated)
South Transverse Crack.



April, 1970—Age 36 Months.
South Transverse Crack.

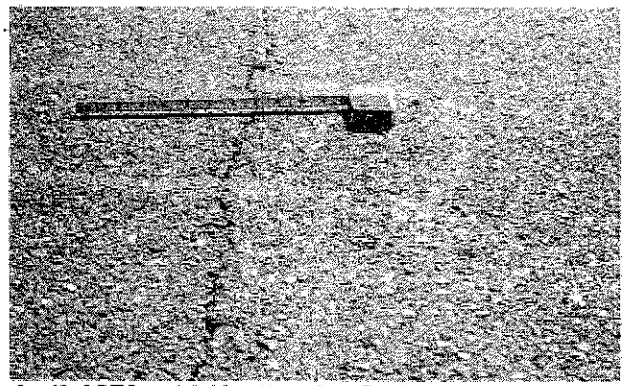


August, 1970—Age 40 Months.
South Transverse Crack.

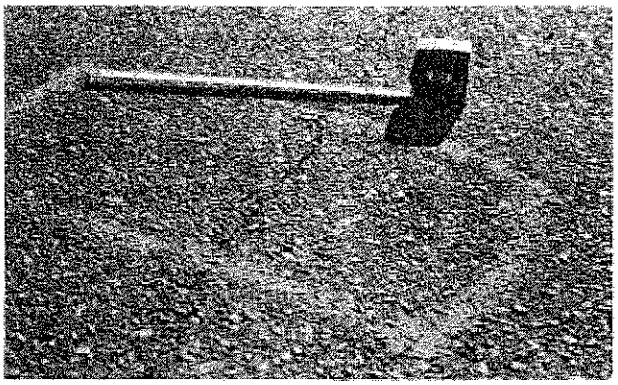


April, 1969—Age 24 Months.
North Transverse Crack.

AREA L ROAD
Control Section
(Untreated)



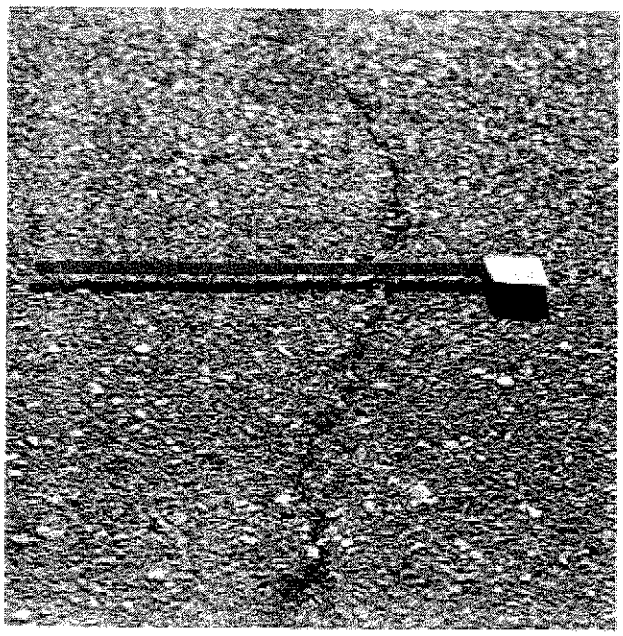
April, 1970—11 Months after Reclamite.
South Transverse Crack.



August, 1970—15 Months after Reclamite.
South Transverse Crack.

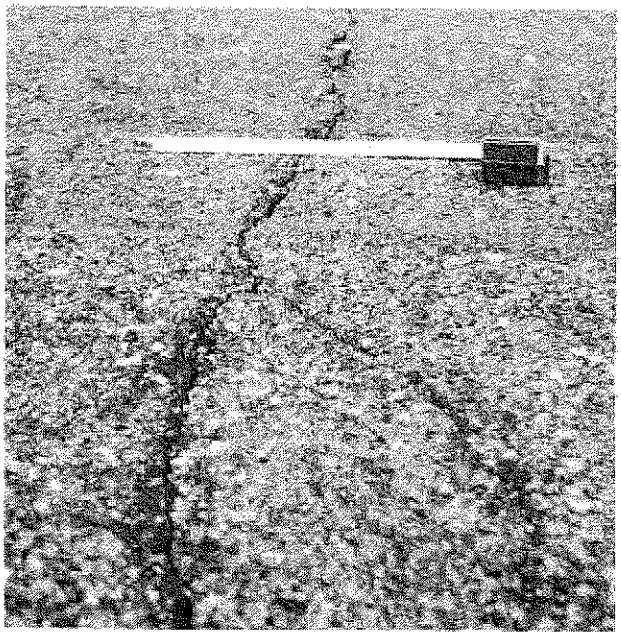
April, 1969—Age 24 Months.
North Transverse Crack.

AREA L ROAD
Test Section
(Treated)



August, 1969—Age 28 Months.

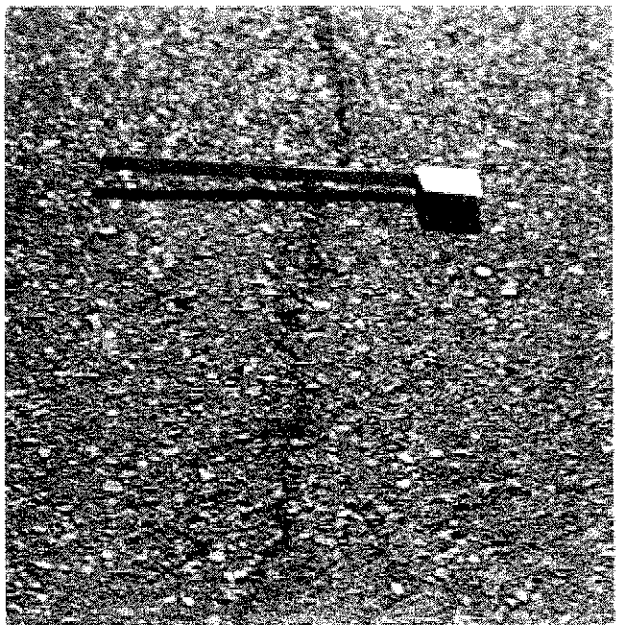
December, 1969—Age 32 Months.



April, 1970—Age 36 Months.

August, 1970—Age 40 Months.

AREA L ROAD
Control Section
(Untreated)
North Transverse Crack.



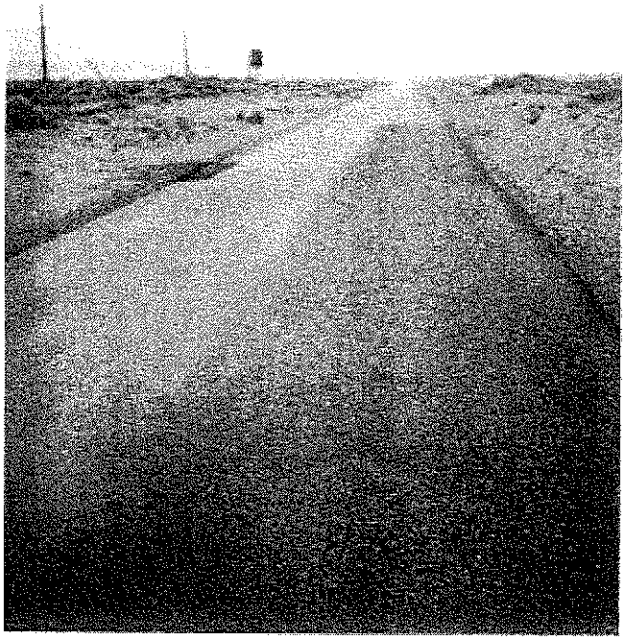
August, 1969—3 Months after Reclamite.

December, 1969—7 Months after Reclamite.

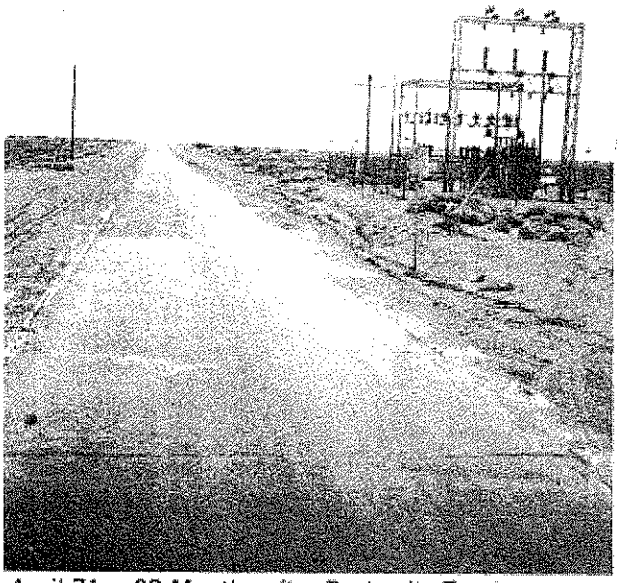
April, 1970—11 Months after Reclamite.

August, 1970—15 Months after Reclamite.

AREA L ROAD
Test Section
(Treated)
North Transverse Crack.



April 70 —
11 Months after
Reclamite Treatment.



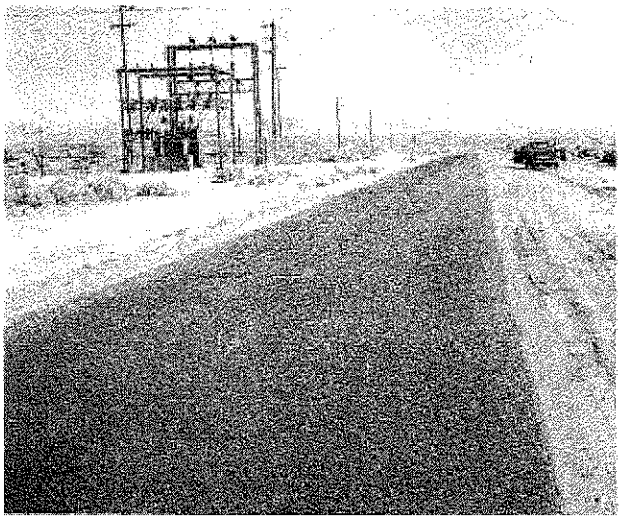
April 71—23 Months after Reclamite Treatment.

April 71—23 Months after Reclamite Treatment.

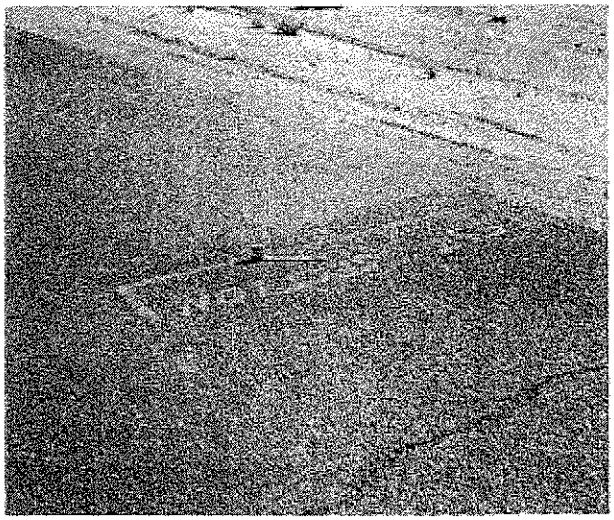
AREA L ROAD
Special Pictures
Taken After Light Rain.

April 71—After light rain
23 months after treatment.

April 71—After light rain
23 months after treatment.



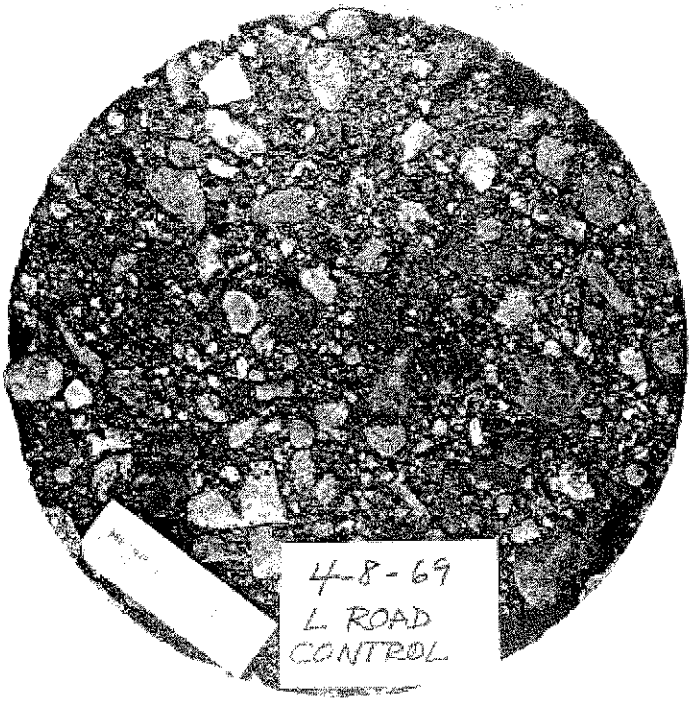
August 70—View of test section from a distance—
15 months after treatment.



August 70—15 months after treatment.

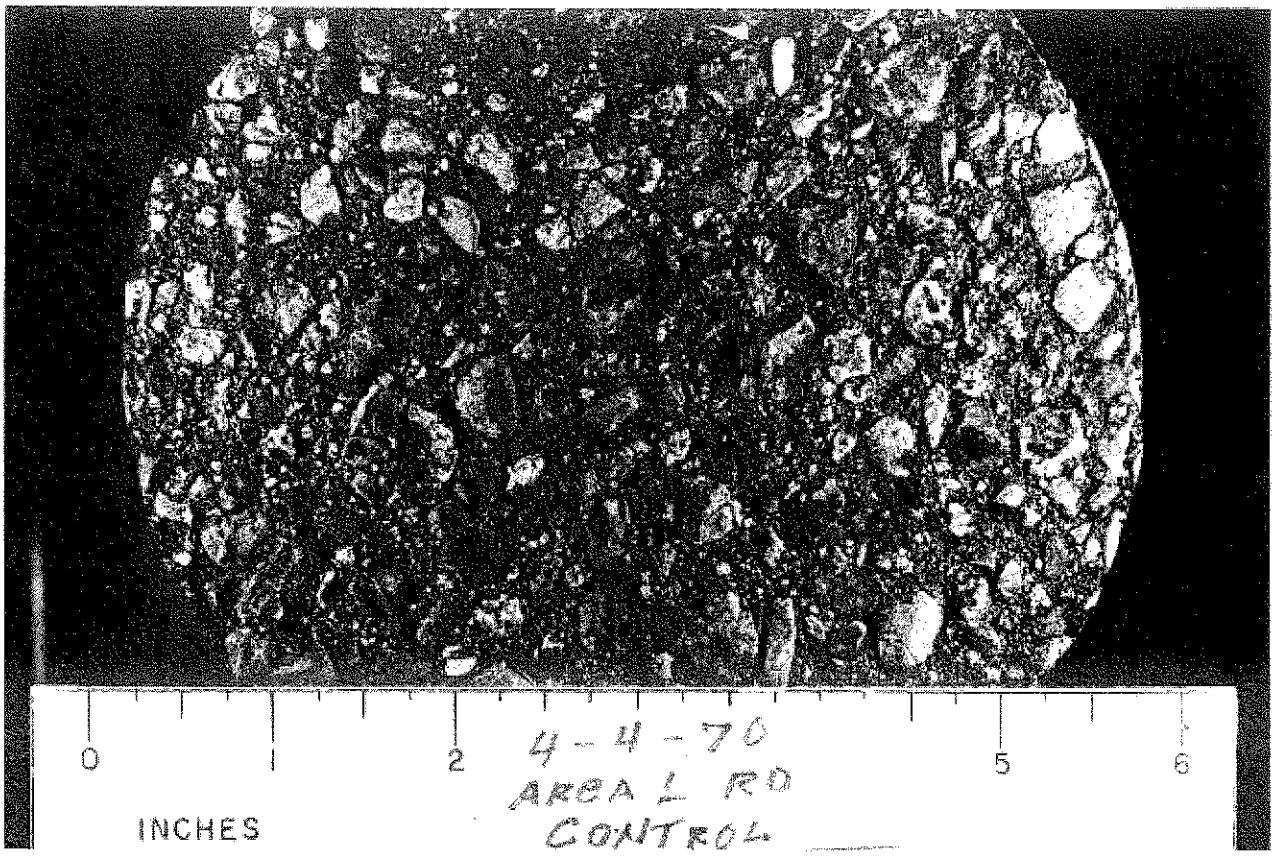
August 70—15 months after treatment.

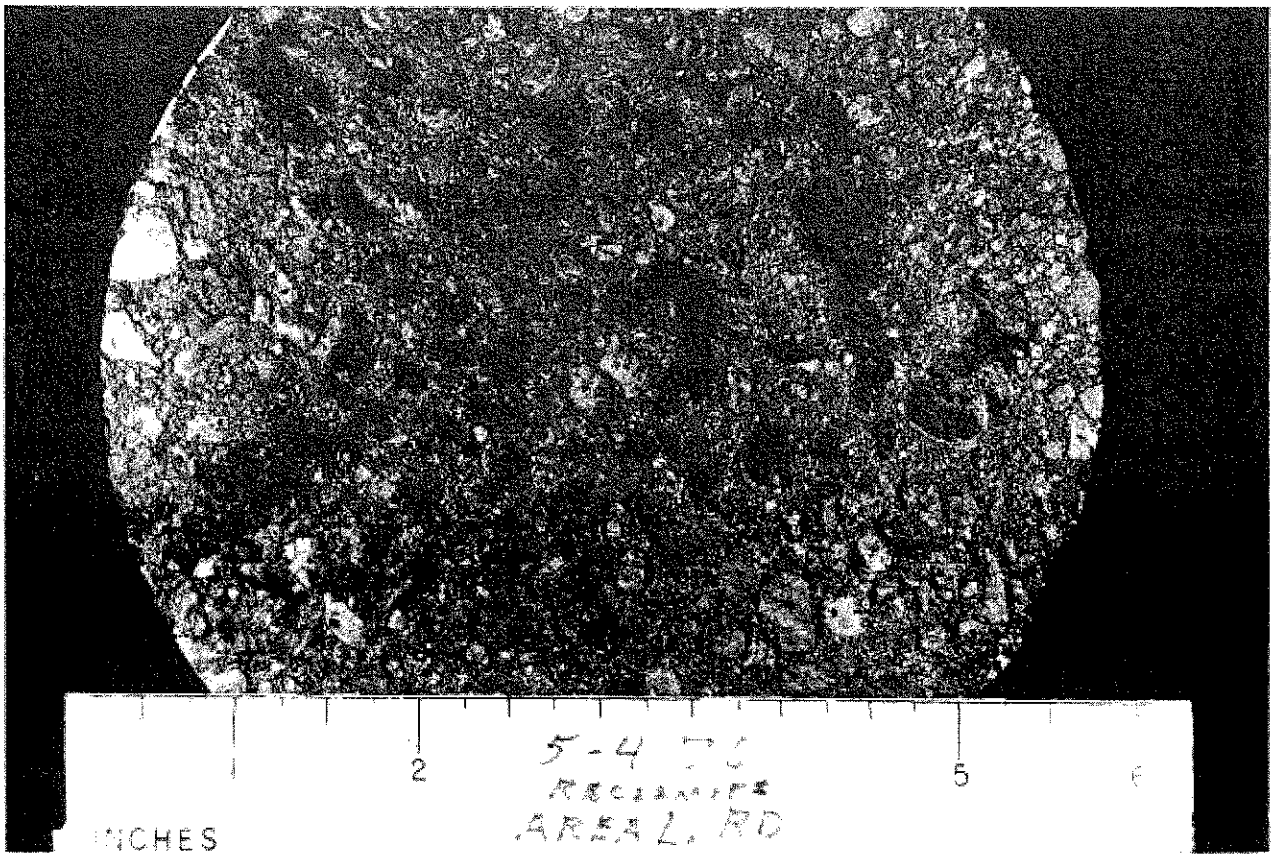
AREA L ROAD
Special Pictures



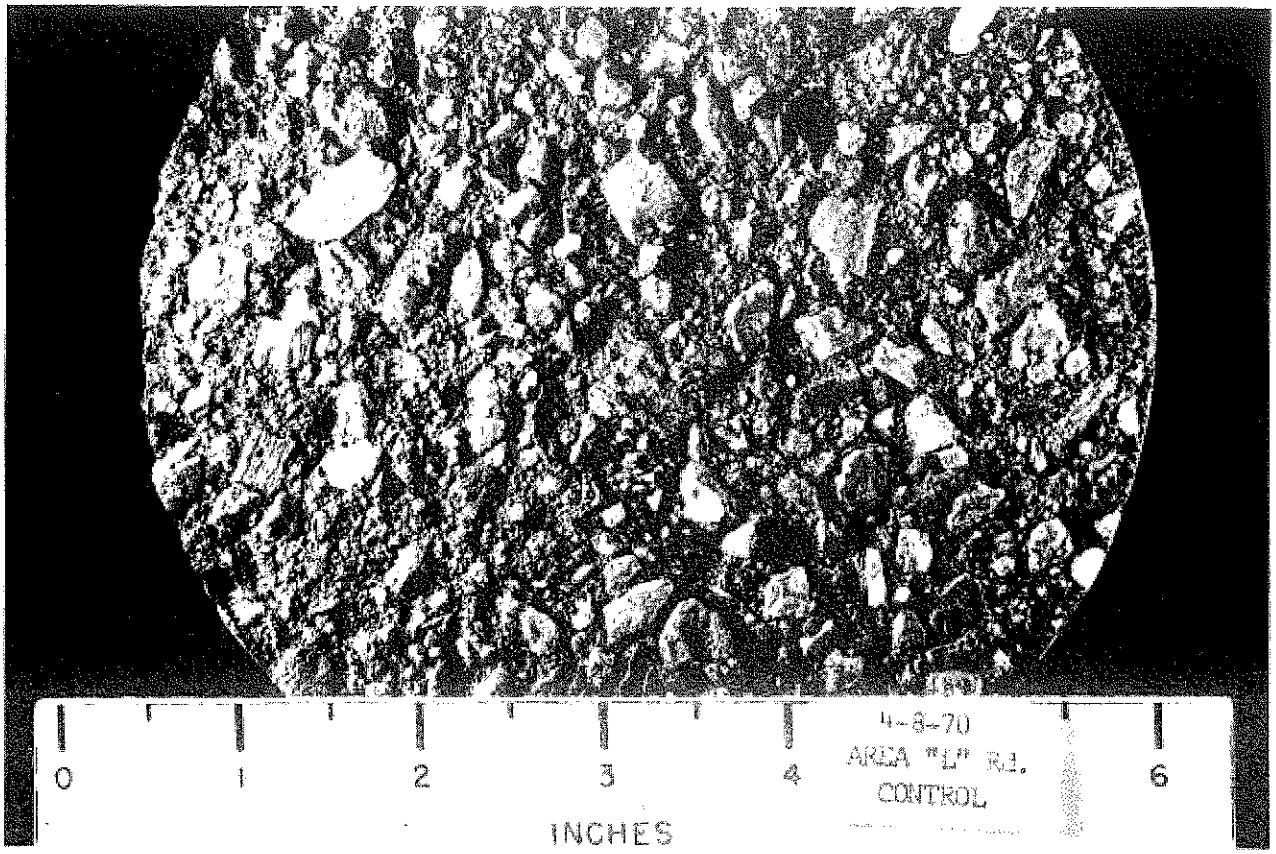
AREA L ROAD

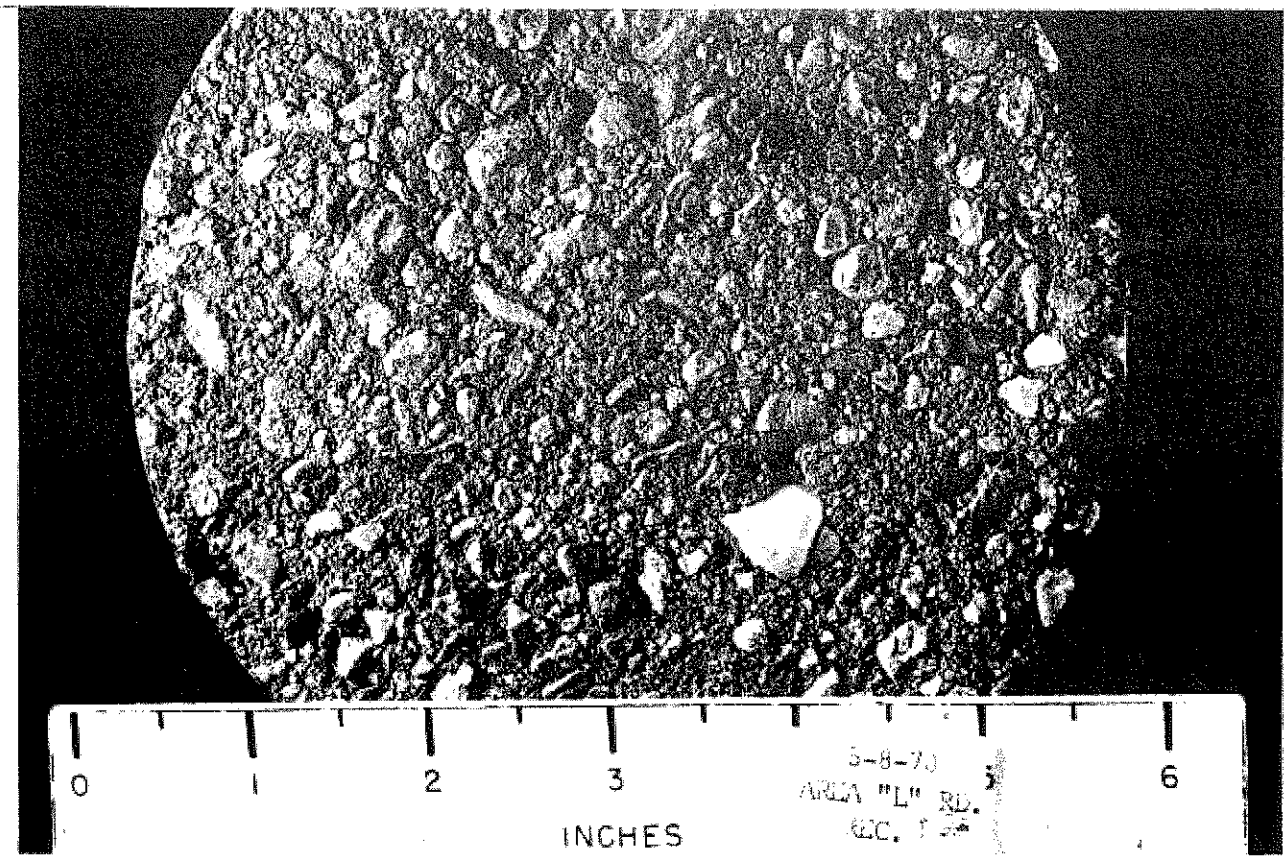
AREA L ROAD





AREA L ROAD


0
1
2
3
4
6
INCHES
4-8-70
AREA "L" RD.
CONTROL


0
1
2
3
6
INCHES
5-8-70
AREA "L" RD.

AREA L ROAD

CONCLUSION

The results obtained from the data gathered both in the field and from the laboratory reports show conclusively that Reclamite does prolong the life of asphalt concrete pavements. The highest penetration values were obtained from the cores taken on Area-L Road, which received the larger of the application rates used (0.15 G/sy). It therefore would be wise to use the largest application rate permissible within the limits of the Ring Test (as specified by the manufacturer). It is also observed that for the top ¼" of pavement Reclamite achieves its maximum effect within the first month. For the ½"-1" portion the largest increase is noticed within the first month and then increases slightly in two of the three roads for the remainder of the test period.

The difference in surface texture that is noticed by visual inspection at the site is quite impressive. The so-called "Pock" marks are caused by lost aggregate and signal the beginning of a "pitted" pavement, which in turn is caused by aging of the asphalt. If this pavement is not brought back to life or rejuvenated, cracking will begin which leads to base and pavement failure and ultimately replacement of the pavement from the base up.

Cracks existing in pavements before treatment tend to close up after being treated with Reclamite. This observed crack healing is a result of the kneading effect of traffic on a pavement which has had its penetration value increased.

As was previously mentioned at the start of this report, two other roads with test sections were intended to be part of this report, but sufficient doubt existed regarding their reliability as test sections as to render them useless. Unfortunately, one of these roads was set up to compare the effects of Reclamite against those of a fog seal (SS-1h). It is anticipated that in the near future a similar opportunity will present itself to establish the relative merits of Reclamite as compared to other types of surface treatments. It should be kept in mind, however, that the primary advantage of Reclamite rests in its ability to restore or rejuvenate pavement, with sealing of the pavement surface as a welcome side effect. A fog seal, on the other hand, acts primarily as a seal coat, and its rejuvenating ability is limited to the pavement surface.

This report so far has dealt with a pavement age of two years plus. Since then, however, the opportunity presented itself to conduct an additional test using Reclamite as a construction seal. A test section on a freshly laid 1½" overlay was set up for this purpose. Within one week after the overlay was completed, a construction seal consisting of 0.08 GPSY of 2.1 Reclamite dilution was applied to the surface in November 1971. The pictures on pages 34 and 35 taken in October and November 1972, approximately one year later visually shows the results of this construction seal.

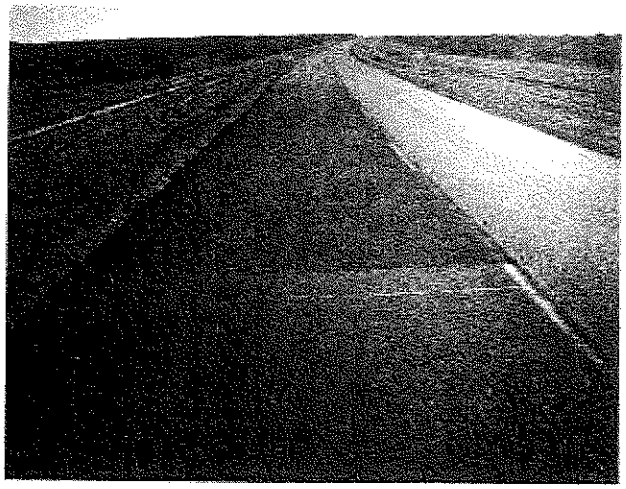
The first two pictures show the control section clearly. The control section, of course, was the untreated portion of the road. Pictures 3 and 4 are pictures of the same crack across the section but taken from opposite sides of the road. Picture No. 5 is a close-up of the start of the section, notice that the actual point the spray bars were shut off missed the guide line painted on the pavement. Picture No. 6 is

another transverse crack across the section. Pictures 7 through 10 were taken while the pavement was drying after a rainstorm. The wet (dark colored) portion of the road is the untreated control section and substantiates, to a large degree, Reclamite's claim as a seal coat. Picture No. 11 on page 36 was taken in March, 1973 (16 months after construction). The control or untreated side (left half of the picture) illustrates the difference in surface texture as compared to the treaded side. A definite difference in the magnitude of the reflective crack can also be seen as the crack travels across the width of pavement.

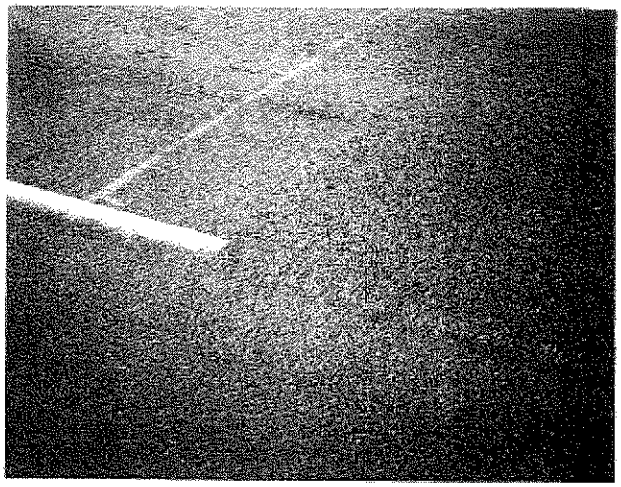
Finallly, pictures No. 12 and No. 13, (page 36) also taken in March, 1973, illustrate the condition of Area-"L" Rd. and G-2 Tower Rd. (two of the roads tested in this report), as they appear at the conclusion of this report. These pictures illustrate the degree of deterioration to be expected six years later, of untreated pavement as compared to treated pavement.

A supplemental report on Reclamite published by the Naval Civil Engineering Laboratory at Port Hueneme, California 93041, is recommended for those who would desire the opinions of a cross-section of users throughout the country. The report is titled:

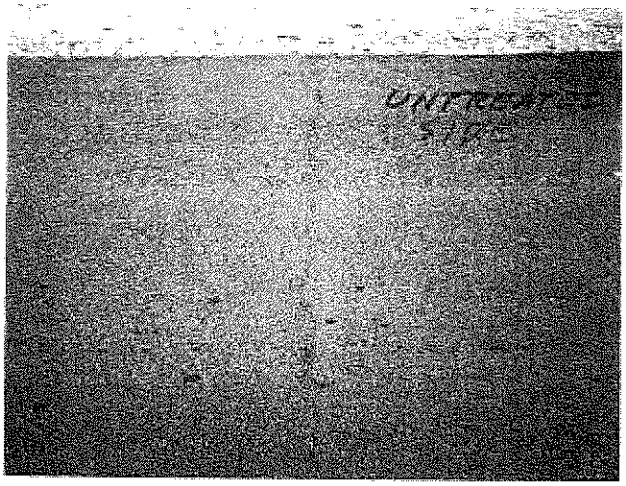
Technical Report No. R690 "Reclamite as a Life Extender for Asphaltic Concrete Pavements."



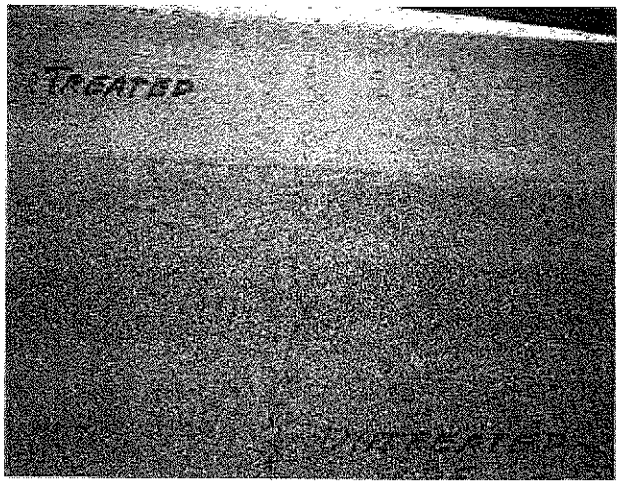
1. Distant view of test section.



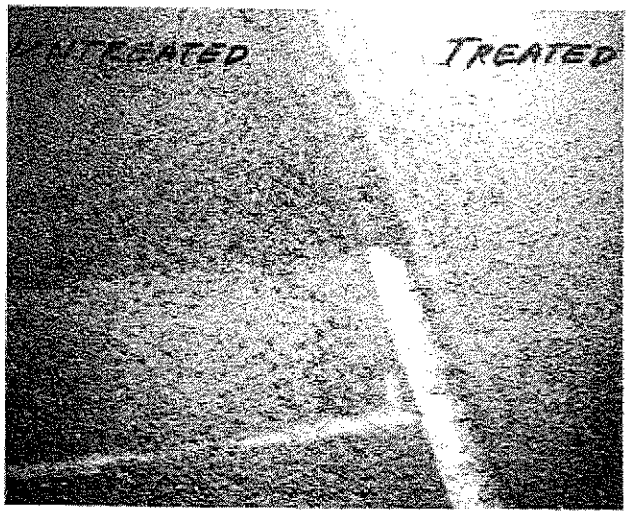
2. Close-up of beginning of test section.



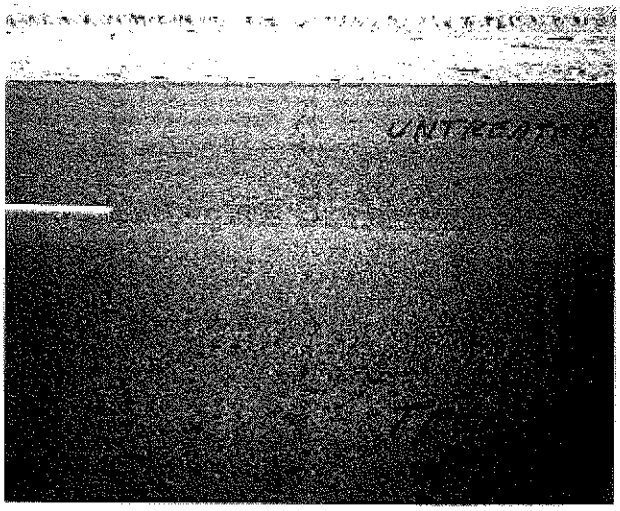
3. Crack across test section.



4. Crack across test section.

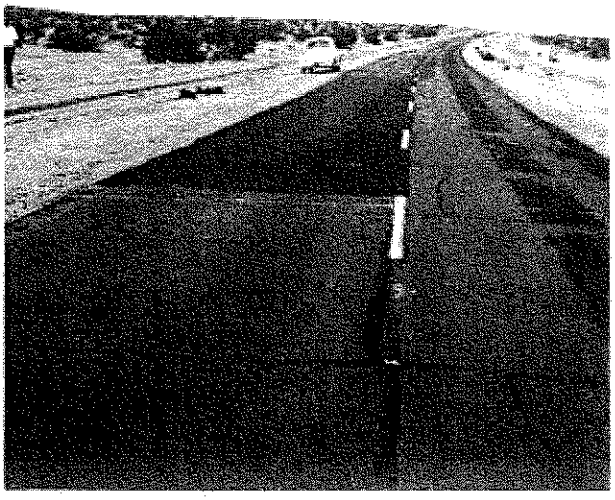


5. Close-up beginning of test section.



6. Close-up of drying pavement at beginning of test section.

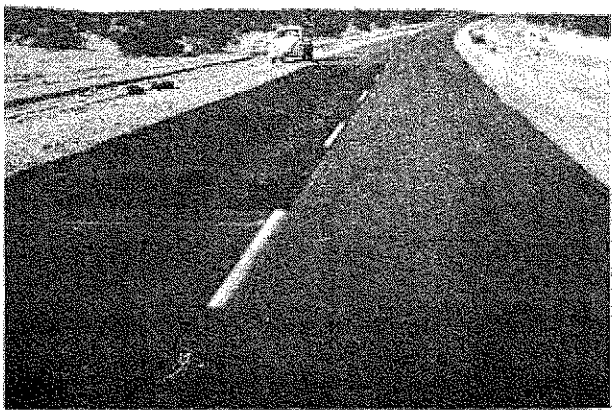
CONSTRUCTION SEAL—4TH STREET
November, 1972—1 Year after Application.



7. Pavement drying after rainstorm.

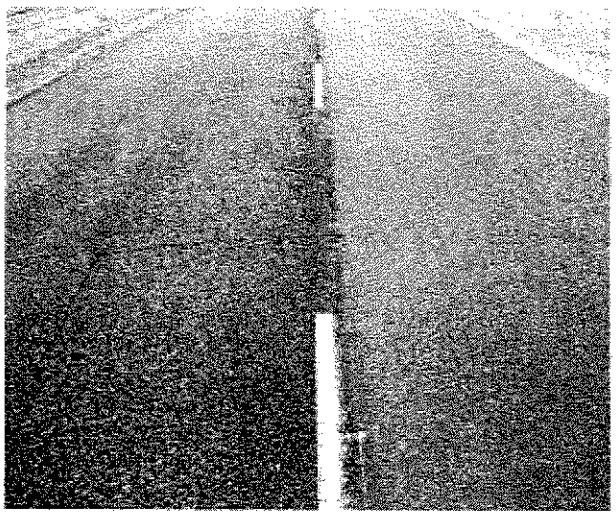
8. Close-up of drying pavement at beginning of test section.

9. After rainstorm untreated pavement is still wet while pavement has dried.



10. View of test section after rain.

CONSTRUCTION SEAL—4TH STREET
October, 1972—11 Months after Application.



11. Construction Seal—4th Street. View of treated and untreated taken March, 1973.
Note texture difference between untreated (left side) and treated (right side) 16 months after Construction and Reclamite Treatment.

12. Area L Road. View of treated and untreated, taken March 1973, 6 years after Construction and 4 years after Reclamite Treatment.

13. G-2 Tower Road. View of treated and untreated, taken March 1973, 6 years after Construction and 4 years after Reclamite Treatment.

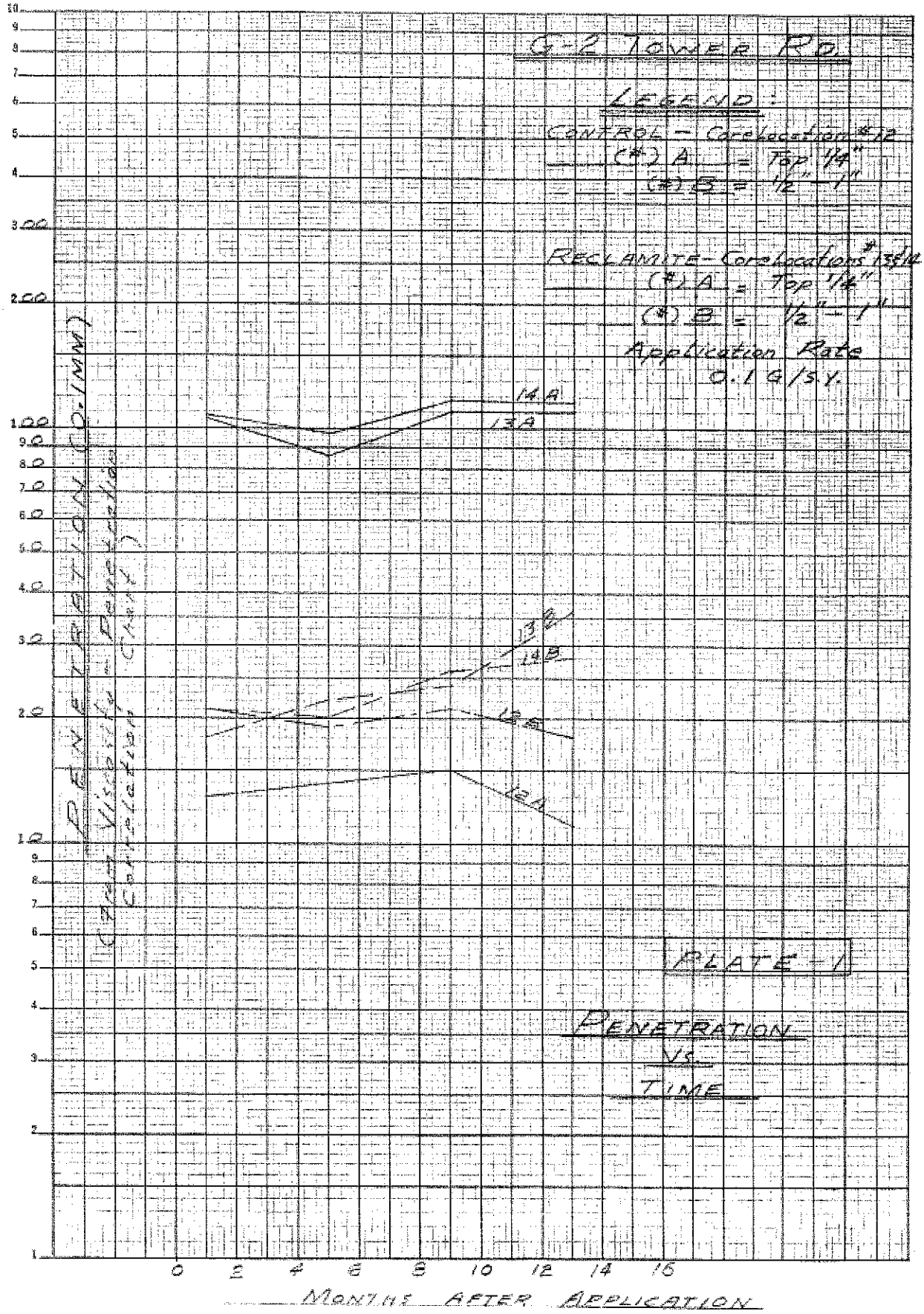

C-2 Tower Rd.
Legend:
Control - Core location #12
(#) A = Top 1/4"
(#) B = 1/2" - 1"
Reclamite - Core locations #13 & #14
(#) A = Top 1/4"
(#) B = 1/2" - 1"
Application Rate
0.1 G/S.Y.
14 A
13 B
13 A
14 B
12 B
12 A
PLATE - 1
PENETRATION
VS
TIME
Months After Application

Plate 1

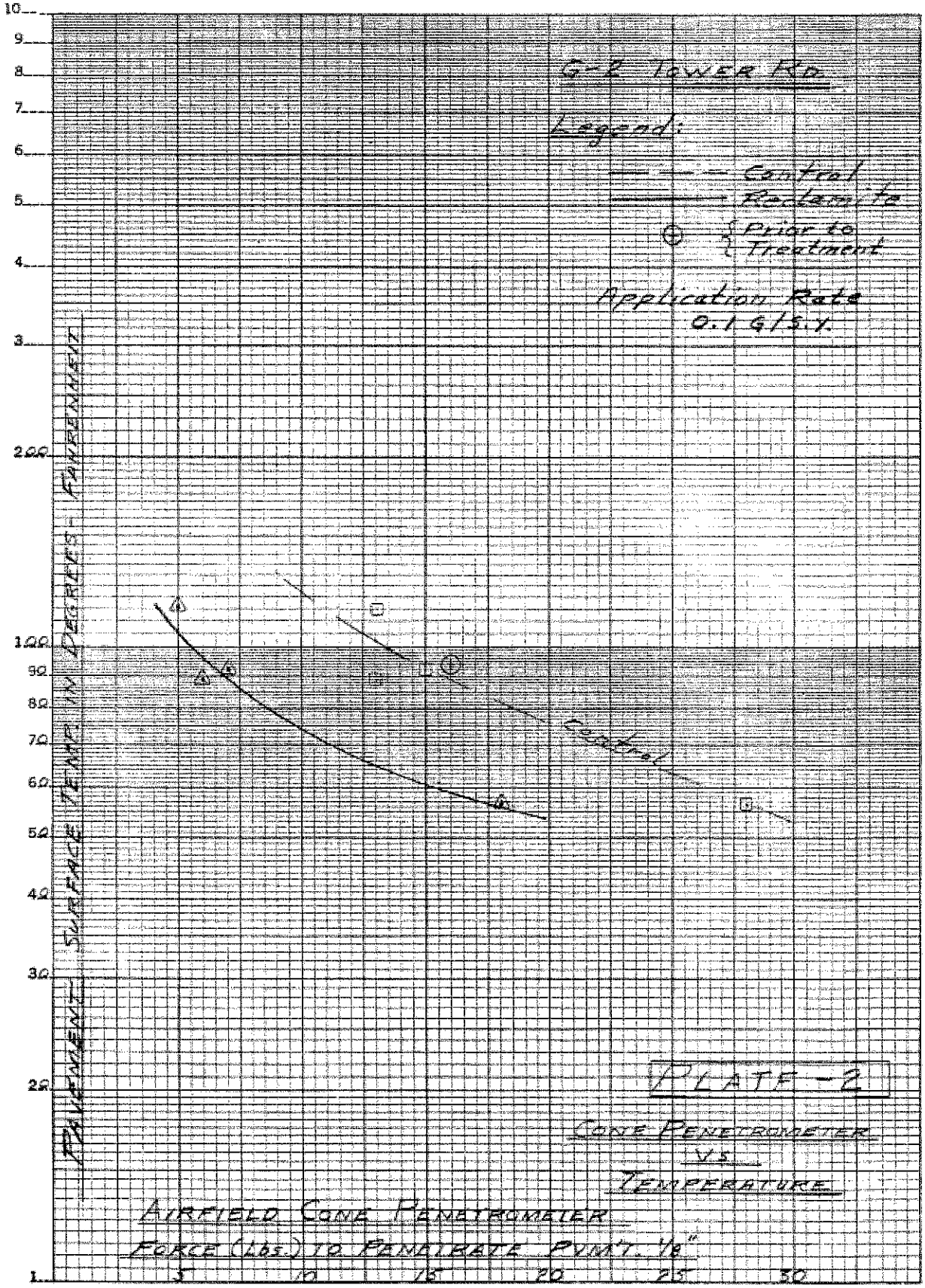

G-2 Tower Rd.
Legend:
Control
Reclaim to
Prior to
Treatment
Application Rate
0.1 G/S.Y.
PLATE - 2
CONE PENETROMETER
VS
TEMPERATURE
AIRFIELD CONE PENETROMETER
FORCE (LBS.) TO PENETRATE PVMT. 1/8"
SURFACE TEMP. IN DEGREES FAHRENHEIT
PAVEMENT
10
9
8
7
6
5
4
3
200
100
90
80
70
60
50
40
30
20
1
5
10
15
20
25
30

Plate 2

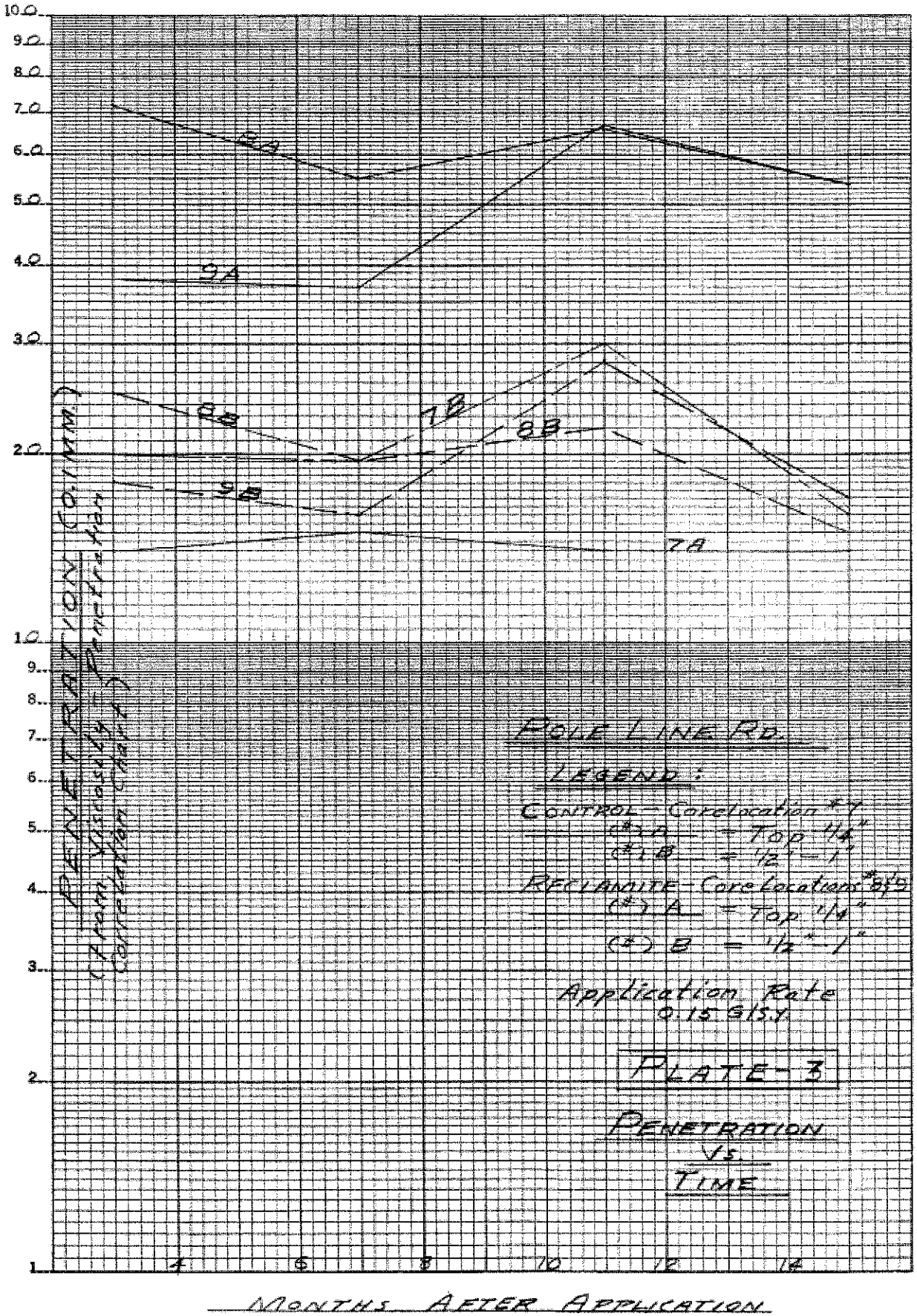

10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
9
8
7
6
5
4
3
2
1
4
6
8
10
12
14
9A
9B
1B
8B
7A
POLE LINE RD.
LEGEND:
CONTROL - Core location #7
(2) A - Top 1/4"
(2) B - 1/2" - 1"
RECLAMITE - Core Locations #8,9
(2) A - Top 1/4"
(2) B - 1/2" - 1"
Application Rate
9.15 915.X
PLATE - 3
PENETRATION
VS.
TIME
MONTHS AFTER APPLICATION

Plate 3

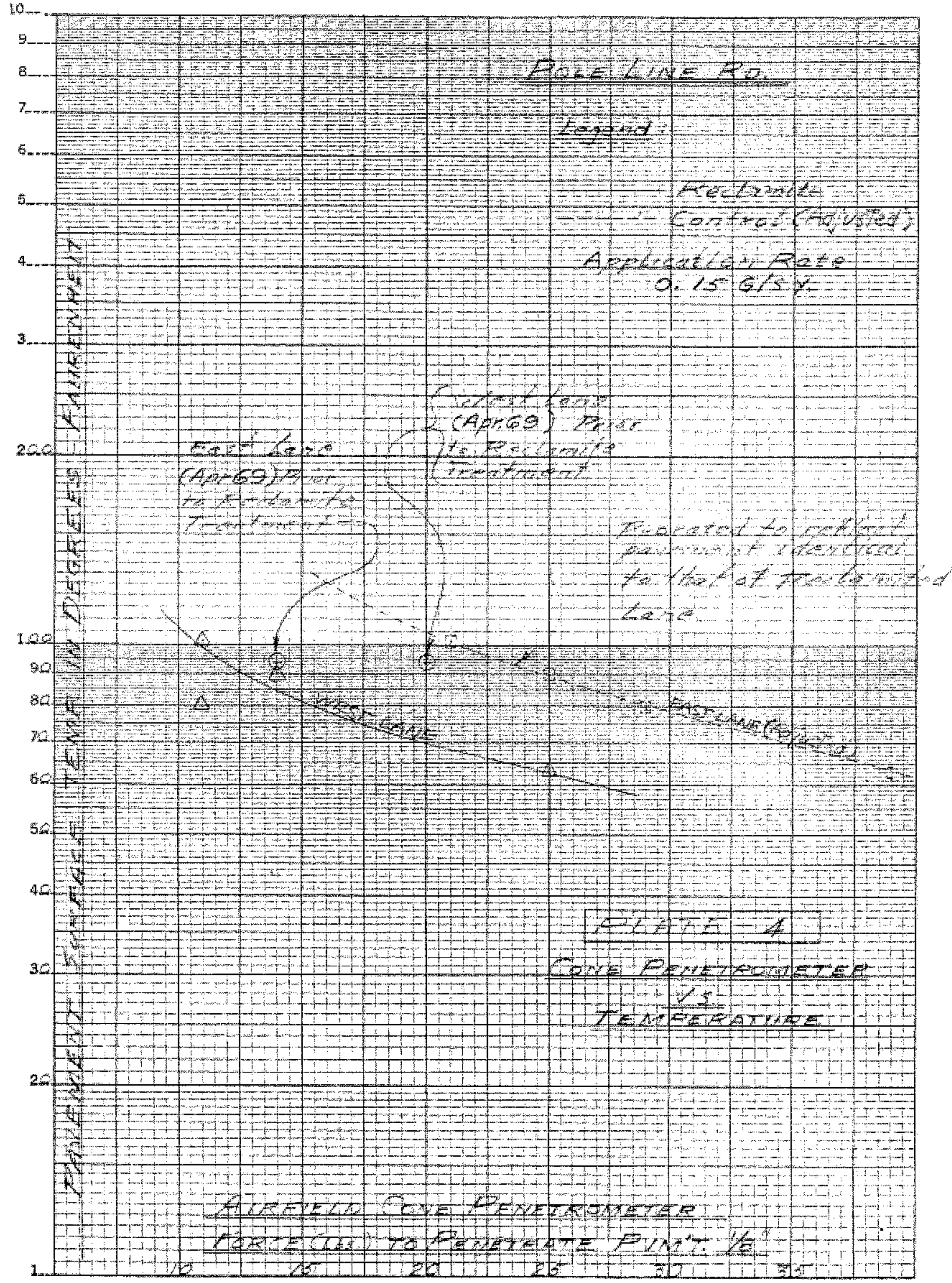

POLE LINE RD.
Legend:
Reclamite
Control (Adjusted)
Application Rate
0.15 G/S.Y.
East Lane
(Apr69) Prior
to Reclamite
Treatment
West Lane
(Apr69) Prior
to Reclamite
Treatment
West Lane
East Lane
PLATE 4
CONE PENETROMETER
VS
TEMPERATURE
AIRFIELD CONE PENETROMETER
FORCE (LB) TO PENETRATE PMT. 1/8"
PAVEMENT SURFACE TEMP IN DEGREES FAHRENHEIT
10
15
20
25
30
35
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
200

Plate 4

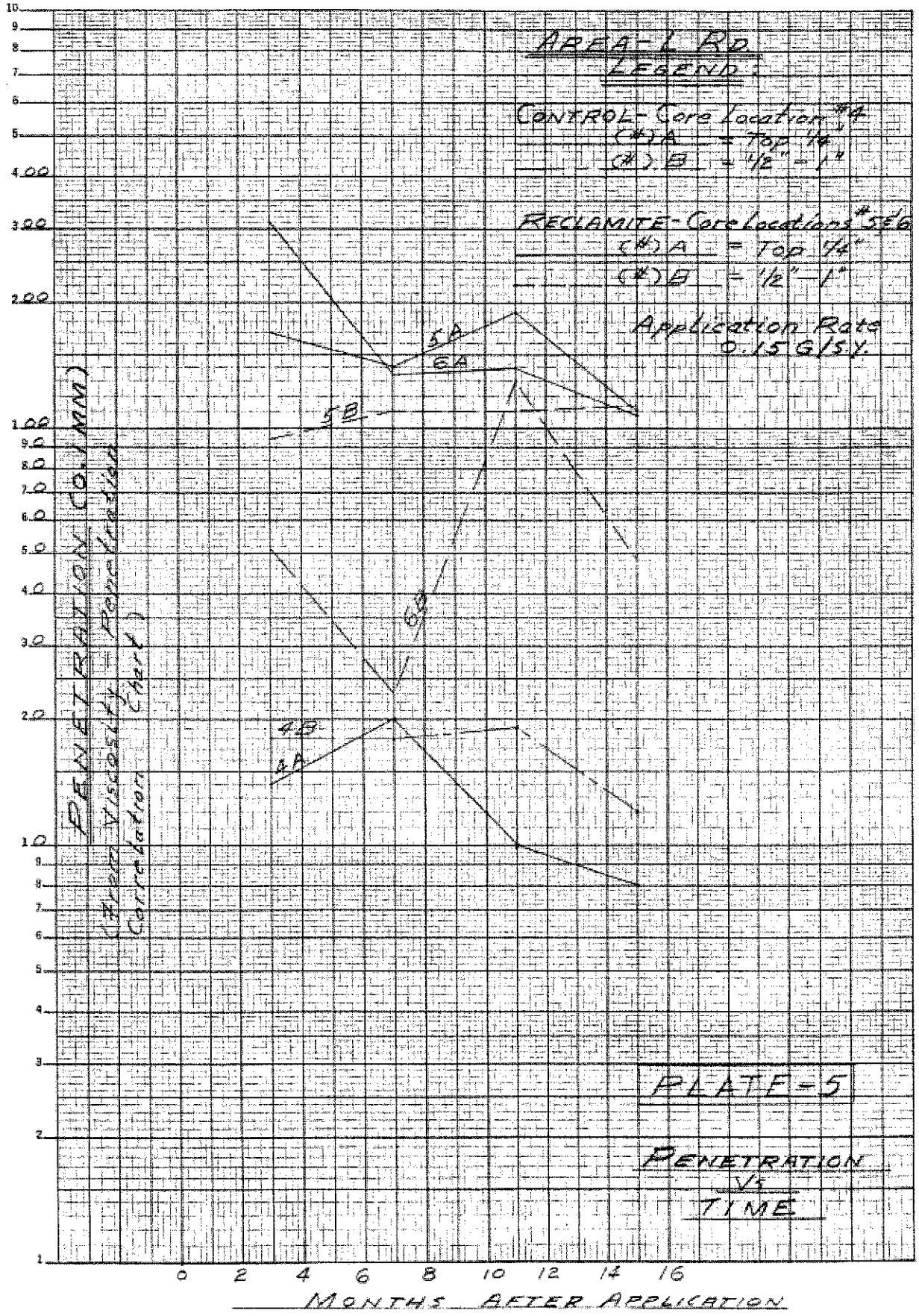

AREA-1 RD.
LEGEND:
CONTROL - Core Location #4
(#) A = Top 1/4"
(#) B = 1/2" - 1"
RECLAMITE - Core Locations #5 & 6
(#) A = Top 1/4"
(#) B = 1/2" - 1"
Application Rate
0.15 G/S.Y.
5A
6A
5B
6B
4B
4A
PLATE-5
PENETRATION
VS
TIME
PENETRATION (0.1 MM)
MONTHS AFTER APPLICATION

Plate 5

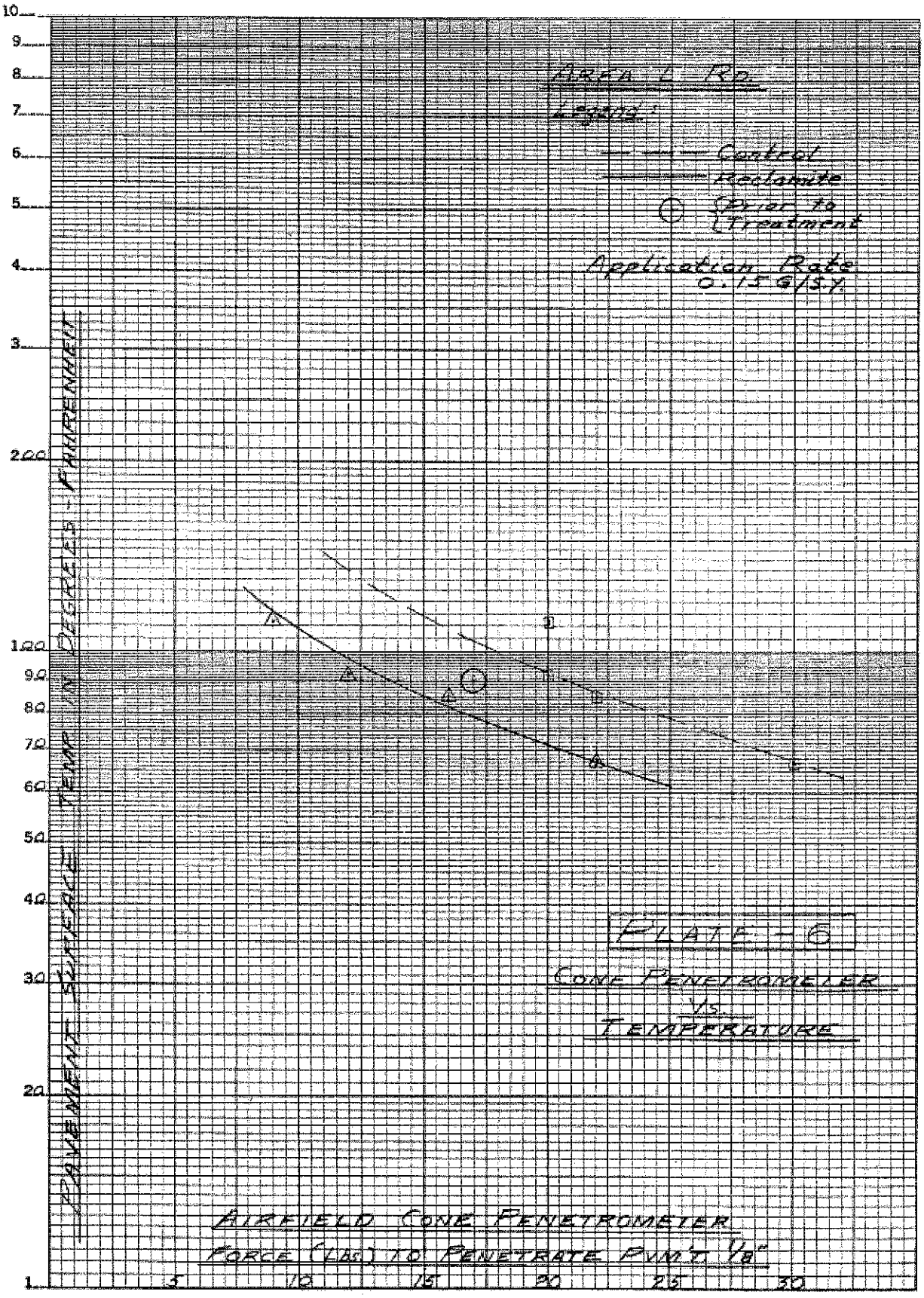

AREA 1 RD
Control
Reclamite
Prior to Treatment
Application Rate
0.15 G/S.Y.
PAVEMENT SURFACE TEMP IN DEGREES FAHRENHEIT
10
9
8
7
6
5
4
3
200
100
90
80
70
60
50
40
30
20
1
PLATE - 6
CONE PENETROMETER
1/15
TEMPERATURE
AIRFIELD CONE PENETROMETER
FORCE (LBS.) TO PENETRATE PUNCH 1/8"
5
10
15
20
25
30

Plate 6

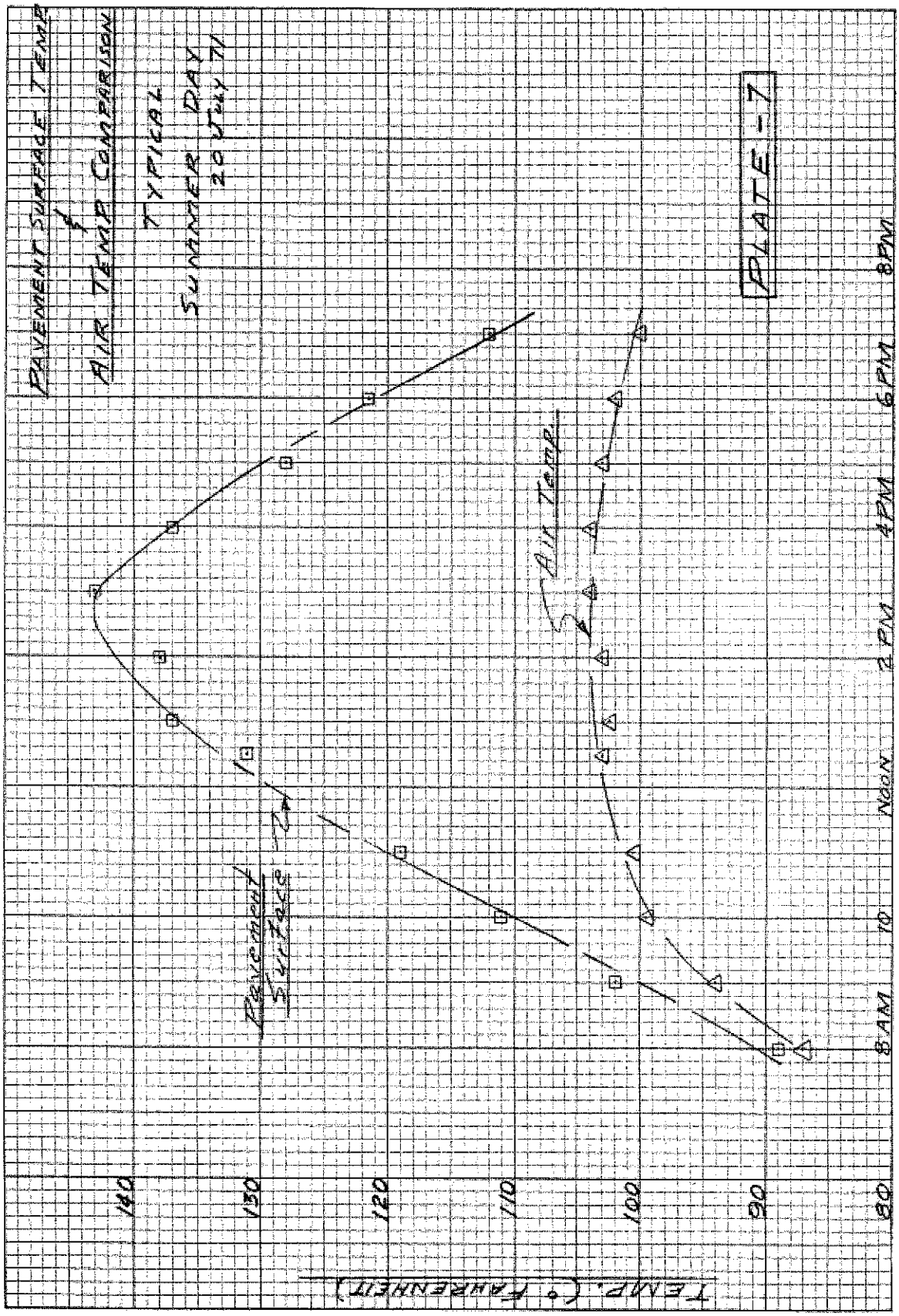

PAVEMENT SURFACE TEMP & AIR TEMP COMPARISON
TYPICAL SUMMER DAY
20 Jun 71
PLATE -7
TEMP. (° FAHRENHEIT)
140
130
120
110
100
90
80
8 AM
10
NOON
2 PM
4 PM
6 PM
8 PM
TIME
Pavement Surface
Air Temp.

Plate 7

APART
ASPHALT PAVEMENT & RECYCYLING TECHNOLOGIES, INC.

5207 Minter Field Avenue
Shafter, CA 93263
Telephone: (661) 393-2748
Fax: (661) 393-2804
bobs@apartshafter.com
michaels@apartshafter.com

Report: 18-1218 **December 28, 2018**

Customer: Corrective Asphalt Materials, LLC – Jack Witte

Project: McHenry County, Illinois

Samples submitted:

Four core samples (two untreated and two treated with RECLAMITE®)

Requested Testing:

Determine the Dynamic Shear Rheology (DSR) properties at 60°C of the recovered asphalt binder from the top 3/8-inch layer of each core. In addition, determine the chemical characteristics of the asphalt in the top 3/8-inch layer of each core.

Summary of Testing:

The top 3/8-inch of each core was removed for testing. The asphalt from each core was extracted and recovered as prescribed by California Test Method 365. Viscosities, phase angles, and moduli were determined on the recovered asphalt binder of each sample using a DSR as prescribed by AASHTO T315. Test data are reported by Table I. The chemical characteristics of each core was determined as per ASTM D2006. Test data are reported by Table II.

Conclusion:

Reported data are based on the testing of a limited sample submitted as being representative of the treated and untreated pavements.

Table I

Corrective Asphalt Materials, LLC

McHenry County, Illinois

Top 3/8-inch of Core Samples
Dynamic Shear Rheology Properties

Sample	Viscosity 60°C, Poises	Phase Angle, °	MODULUS, 60°C, Pa		
			Complex	Elastic	Viscous
Untreated	7375	80.3	7397	1196	7277
Untreated	7427	80.4	7457	1208	7365
Treated	4590	80.9	4599	724	4532
Treated	4400	80.9	4413	699	4344
Average Decrease, %	65		65	69	65

Table II

Corrective Asphalt Materials, LLC

McHenry County, Illinois

Top 3/8-inch of Core Samples
Chemical Characteristics

	Untreated	Untreated	Treated	Treated
Chemical Composition Analysis				
Asphaltenes, w%	32.1	32.3	27.1	28.7
Polar Compounds, w%	27.0	26.4	30.7	29.2
1st Acidaffins, w%	8.0	7.8	7.2	5.1
2nd Acidaffins, w%	20.6	20.5	23.0	25.5
Saturates, w%	12.3	13.0	12.0	11.5
Maltenes Distribution				
$(PC + A_1) / (S + A_2)$	2.20	2.03	2.56	2.54
PC / S Ratio	1.06	1.02	1.08	0.93

APART
ASPHALT PAVEMENT &
RECYCYLING TECHNOLOGIES, INC.

5207 Minter Field Avenue
Shafter, CA 93263
Telephone: (661) 393-2748
Fax: (661) 393-2804
bobs@apartshafter.com
michaels@apartshafter.com

Report: 18-0924 **October 1, 2018**

Customer: Corrective Asphalt Materials, LLC – Jack Witte, Tony Witte

Project: City of Urbana, Illinois

Samples submitted:

Eight cores samples (4 before and 4 after treatment) identified as:

Vine Street
Lincoln Avenue

The untreated samples were taken on 07-25-18.
The treated samples were taken on 09-10-18.

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 (CTM) 365. Viscosities were determined on the recovered asphalt binder using a sliding plate microviscometer (CTM 348). Penetrations were calculated from a nomograph. Test data are reported by Table I.

Conclusion:

Reported data are based on the testing of a limited sample submitted as being representative of the treated and untreated pavements.

Table I

Corrective Asphalt Materials, LLC

City of Urbana, Illinois
Top 3/8" of Core Samples

Sample Identification	Microviscosity, 25°C, MP		Equivalent Penetration
	0.05 sec^{-1}	0.001 sec^{-1}	
Vine Street			
Untreated	27.5	26.4	19
Untreated	27.2	26.0	19
Treated	13.5	12.4	27
Treated	13.7	12.8	27
Increase in Penetration, %	42		
Decrease in Viscosity, %	101		
Lincoln Avenue			
Untreated	24.8	23.3	20
Untreated	24.4	23.0	20
Treated	11.6	10.7	29
Treated	11.4	10.6	29
Increase in Penetration, %	45		
Decrease in Viscosity, %	114		

2019 ROADWAY MAINTENANCE PROGRAM
STREETS ESTIMATED FOR PRESERVATIVE SEAL

STREET	FROM	TO	LENGTH LF	AREA SY
61ST ST	FAIRMOUNT AVE	BLODGETT AVE	690	2147
62ND PL	BROOKBANK RD	CARPENTER ST	601	1870
67TH CT	FAIRVIEW	WEST END	1353	3082
68TH ST	FAIRMOUNT AVE	FAIRVIEW AVE	1832	6611
72ND CT	CUL DE SAC	72ND ST	315	1424
73RD ST	HARTFORD RD	FAIRMOUNT AVE	850	2644
73RD ST	BAYBURY RD	LYMAN AVE	470	1071
74TH ST	HARTFORD RD	YORK RD	425	1322
ASHBURY AVE	BAYBURY RD	CANTERBURY PL	310	964
BAYBURY RD	ASHBURY AVE	73RD ST	580	1804
BELDEN AVE	MAPLE AVE	CURTISS ST	470	1149
BENTLEY CT	GRAND AVE	W. END	208	865
BLACKBURN PL	N END	68TH ST	350	1445
BLANCHARD ST	DUNHAM RD	MAIN ST	2615	6173
BROOKBANK RD	BLANCHARD ST	55TH ST	1210	2622
BROOKBANK RD	BLANCHARD ST	JEFFERSON AVE	643	2000
BROOKBANK RD	63RD ST	59TH ST	2612	10385
BUCKINGHAM PL	GRAND	FAIRVIEW	940	3030
CANTERBURY PL	CUL DE SAC	ASHBURY AVE	431	1534
CANTERBURY PL	STOCKLEY RD	ASHBURY AVE	440	1369
CHURCHILL CT	BUCKINGHAM PL	N END	195	830
CLAREMONT DR	PINEWOOD	MAIN ST	748	2327
CURTISS ST	WASHINGTON ST	MACKIE PL	1058	3359
FAIRMOUNT AVE	59TH ST	55TH ST	2630	8182
FAIRMOUNT AVE	72ND ST	67TH ST	3369	10481
FOREST AVE	FRANKLIN ST	PRAIRIE AVE	540	1500
FRANKLIN ST	PRINCE ST	FOREST AVE	330	880
GILBERT AVE	CORNELL AVE	CARPENTER ST	4205	11102
GRAND AVE	55TH ST	HILL ST	1440	3840
GRAND AVE	62ND ST	61ST ST	640	1351
GRAND AVE	BENTLEY CT	68TH ST	485	1509
GRAND AVE	BUCKINGHAM PL	BENTLEY CT	480	1598
HARTFORD RD	74TH ST	73RD ST	470	1462
HILL ST	GRAND AVE	FAIRVIEW AVE	650	1806
JEFFERSON AVE	BROOKBANK RD	NELSON CT	330	1027
LYMAN AVE	CUL DE SAC	55TH ST	3076	7763
MACKIE PL	MAPLE AVE	CURTISS ST	331	846
MAIN ST	FRANKLIN ST	OGDEN AVE	3790	17668
MAIN ST	75TH ST	LEMONT RD	2023	10789
MAPLE AVE	MAIN ST	FAIRVIEW AVE	4441	14336
MIDDAUGH AVE	59TH ST	55TH ST	2537	6061
NELSON CT	JEFFERSON AVE	NORTH CUL DE SAC	175	594
OSAGE AVE	S END	68TH ST	650	2266
OSAGE PL	N END	68TH ST	337	1402
PINEWOOD DR	CLAREMONT DR	S END	418	1289
PINEWOOD DR	PINEWOOD DR N/S	LEMONT RD	345	997
RIDGEVIEW ST	CUL DE SAC W	CUL DE SAC E	1030	4047
STOCKLEY RD	W. END	74TH ST	1047	2958
TRENT RD	74TH ST	73RD ST	435	1353
WASHINGTON ST	55TH ST	SUMMIT ST	730	1987
WILLIAMS ST	41ST ST	39TH ST	1825	5678
WILLIAMS ST	55TH ST	SECOND ST	2600	6500
WOLF PL	CUL DE SAC	68TH ST	175	875
YORK RD	74TH ST	73RD ST	366	1139
		Total >	61,246	193,312
		Miles >	11.60	

VILLAGE OF DOWNERS GROVE

SCALE IN FEET
0 1000 2000 3000 4000 5280FT
0 500 1000 1500M
SCALE IN METERS
7/22/97

PRESERVATIVE SEAL

VILLAGE OF DOWNERS GROVE
DEPARTMENT OF PUBLIC WORKS
5101 WALNUT AVENUE 60515 TEL. (630) 434-5460

2019 PRESERVATIVE SEAL

LOCATION MAP

Village of Downers Grove
Contractor Evaluation

Contractor: Corrective Asphalt Materials, LLC

Projects: 2018 Pavement Preservative Seal (E)

Primary Contact: Mark Homco Phone: (630) 465-4142

Time Period: September 2018

On Schedule (allowing for uncontrollable circumstances) ☒ Yes ☐ No

Provide details if early or late completion: All work completed in timely fashion prior to completion date.

Change Orders (attach information if needed): CO was processed for final quantity balancing. Project under original bid amount.

Difficulties / Positives: Good ongoing communication with field and office personnel. Generally conscientious regarding specs / workmanship.

Interaction with public:

☐ Excellent ☒ Good ☐ Average ☐ Poor

(Attach information on any complaints or compliments)

General Level of Satisfaction with work:

☐ Well Satisfied ☒ Satisfied ☐ Not Satisfied

Reviewers: Stephanie Graves

Date: 07/10/19