# ASPHALT REJUVENATOR

Revised on: 2/28/2019

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

**Pre-Construction:** The Contractor shall present samples of all proposed materials, laboratory reports, calibration reports, and proof of work experience as required by these specifications to the Engineer at the pre-construction meeting. ***Once all items have been approved, sources will not be changed without written approval by KDOT.***

**Material Specifications:** The asphalt rejuvenating agent shall be an emulsion composed of a petroleum resin oil base 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. ***Once all items have been approved, sources will not be changed without written approval by KDOT.***

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| ASPHALT REJUVENATOR SPECIFICATIONS | | | |
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|  | Test Method | Requirements | |
| Property | ASTM | Min. | Max. |
| Viscosity @ 25°C, SFS | D244 | 15 | 40 |
|  | D244 |  |  |
| Residue, w% | (Mod.)2 | Pass | |
| Sieve Test, w% | D244 (Mod.)1 | - | 0.1 |
| Particle Charge Test | D244 | Positive | |
| Tests on Distillation Residue |  |  |  |
| Flash Point, COC, C | D92 | 196 | - |
| Viscosity @ 60°C, C | D2006-70 | - | 1 |
| Maltene Dist. Ratio |  |  |  |
| (Polar Compounds) + (First Acidaffins) | D2006-70 | 0.3 | 0.6 |
| (Saturates) + (Second Acidaffins) |  |  |  |
| Polar Compounds/ Saturates Ratio | D2006-70 | 0.5 |  |
| Asphaltenes, w% | D2006-70 |  | 1 |
| Saturated Hydrocarbons, w% | D2006-70 | 21 | 28 |

1. Test procedure identical with ASTM D-244 except that distilled water shall be used in place of two (2) percent sodium oleate solution.
2. Test procedure identical with ASTM D-244 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 foam ceases, then cool immediately and calculate results.

**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 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 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.
6. If possible, material used on the project shall be from one run and from one manufacturing plant, on the same date. If not, an effort shall be made to minimize use of different plants and/or runs.

**Applicator Experience:** The asphalt rejuvenating agent shall be applied by an experienced applicator of such material. The bidder shall have a minimum of three years’ experience in applying the product proposed for use 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 locations, 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.

**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 50 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.

**Handling of Asphalt Rejuvenating Agent:** 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 prior to loading of proposed material. 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. Cleanliness of the spreading equipment shall be subject to inspection and the Contractor shall halt the application process when so ordered by the Engineer. A pint-sized sample of the product shall be withdrawn from the distributor truck, prior to placement, for inspection and testing.

**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 % pound 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.

**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. After the street has been treated, the area within one foot of the curb line on both sides of the road shall receive an additional treatment of asphalt rejuvenating emulsion. 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, manufacturer, and the date shipped, for each load of asphalt rejuvenating agent. On a daily basis, the Contractor shall take representative samples of material for testing.

**Field Testing:** Prior to the application of the rejuvenator, ring tests shall be performed. Different rates of application shall be applied in each ring. The time it takes the reclamite to penetrate shall be recorded for each rate of application. Extrapolation shall then be used to determine the appropriate rate of application for the entire road. The testing shall be coordinated with the County’s “On Call” material testing Contractor.

**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.

**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.

***Traffic Control lane closures shall follow IDOT and MUTCD standards.***

**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 REJUVENATOR - RECLAMITE per square yard. Prices shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified and required.