

Please see highlighted sections to determine Street Sweeping, Resident Notification, and Field Testing responsibilities

MALTENE-BASED RESTORATIVE SEAL FOR BITUMINOUS PAVEMENTS

1.0 SCOPE: Emulsified Maltene-Based Restorative Seal

This work shall consist of furnishing all labor, material, and equipment necessary to perform all operations for the application an Emulsified Maltene-Based Restorative Seal to the surface of bituminous pavements as a restorative seal. The restoration of bituminous pavement surfaces shall be by spray application of a cationic restoring emulsion specially designed for this function. The base used for the emulsion shall be naphthenic. All work shall be in accordance with the requirements, the applicable drawings, and subject to the terms and conditions of these guidelines.

2.0 MATERIAL SPECIFICATIONS:

The emulsified asphalt restoring agent shall be a naphthenic petroleum 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 restoring agent’s manufacturer showing that the emulsified product conforms to the requirements below:

Table 1 Naphthenic Emulsified Asphalt Restoring Agent Requirements

Property	Test Method	Requirements
Viscosity, 25°C, SFS	ASTM D244	25-150
Sieve Test, w%	ASTM D244 (Mod) ¹	0.1 Max.
Particle Charge	ASTM D244	Positive
1-day Settlement, w%	ASTM D244	1.0 Max.
Residue, w%	ASTM D244 (Mod) ²	64.0 Min.
Tests on the Residue:		
Viscosity, 60°C, cSt	ASTM D2170	1000-4000
Maltene Distribution Ratio (Polar Compounds) + (First Acidaffins) (Saturates) + (Second Acidaffins)	ASTM D2006-70	0.7-1.1
Polar Compounds/Saturates Ratio	ASTM D2006-70	0.5 Min.
Asphaltenes, w%	ASTM D2006-70	14.0 Max.

¹Test procedure identical with ASTM D244 except that distilled water shall be used in place of two percent sodium oleate solution.

²ASTM D244 Evaporation Test for percent residue is modified by heating a 50 gram sample to 149°C (300°F) until foaming ceases, then cooling immediately and calculating results.

3.0 MATERIAL PERFORMANCE:

The restoring agent shall have a record of satisfactory service as an emulsified asphalt restoring agent and in-depth sealer. Satisfactory service shall be based on the capability of the

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material to decrease the viscosity value of the asphalt binder by a minimum of 20 percent. Testing shall be performed on extracted asphalt cement from a pavement to a depth of three eights inch (3/8"). Extraction and recovery performed using CTM 365, recovered binder tested per AASHTO T315 (DSR). In addition, the pavement shall be in-depth sealed to the intrusion of air and water.

The bidder must submit with his bid the manufacturer's certification that the material proposed for use is in compliance with the emulsified asphalt restoring agent requirements.

4.0 APPLICATOR EXPERIENCE / PRE-QUALIFICATIONS

Prior to submitting a bid, the prospective Contractor shall be prepared to provide a written statement of experience showing at least eight (8) projects of similar character that have been completed within the last year using the same rejuvenating emulsions that he is bidding on in this project. The prospective Contractor shall also submit a statement showing that they had at least five (5) years experience using the same rejuvenating emulsions that they are bidding on, street and road applications only.

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

5.0 PRODUCT STANDARDS

The product "CRF"® as previously manufactured by Witco Corporation-Golden Bear Oil is the standard for the emulsified asphalt restoring agent requirements and the prices quoted on the Bid Sheet Base Bid shall be for the "CRF"® standard.

6.0 APPLICATION TEMPERATURE/WEATHER LIMITATIONS:

The temperature of the emulsified asphalt restoring emulsion, at the time of application shall be as recommended by the manufacturer. The emulsified asphalt restoring agent shall be applied only when the existing surface to be treated is thoroughly dry and when it is not threatening to rain. The emulsified asphalt restoring agent shall not be applied when the ambient temperature is below 35° F.

7.0 HANDLING OF AN EMULSIFIED ASPHALT RESTORING AGENT:

When loading the distributor, the emulsified asphalt restoring agent concentrate shall be loaded first and then the required amount of water for dilution shall be added. The water shall be added into the distributor with enough force to cause agitation and thorough mixing of the two materials. To prevent foaming, the discharge end of the water hose or pipe shall be kept below the surface of the material in the distributor which shall be used as a spreader. Cleanliness of the spreading equipment shall be subject to the approval and satisfaction of the Engineer.

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8.0 RESIDENT NOTIFICATION:

Agency or Contractor handles? If contractor distributes Resident notification, add agency requirements

9.0 APPLYING EQUIPMENT:

The distributor for spreading the emulsion shall be self-propelled, and shall have pneumatic tires. The distributor shall be designed and equipped to distribute the emulsified asphalt restoring agent uniformly on variable widths of surface at readily determined and controlled rates from 0.05 to 0.5 gallons per square yard of surface, and with an allowable variation from any specified rate not to exceed 5 percent of the specified rate. Distributor equipment shall include full circulation spray bars, pump tachometer, volume measuring device and a hand hose attachment suitable for application of the emulsion manually to cover areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the emulsion within the tank.

A check of the 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 2 to 6 pounds of sand per square yard in a single pass. The spreader shall be adjustable so as not to broadcast sand onto driveways or lawns.

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

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

10.0 APPLICATION OF RESTORING AGENT:

The emulsified asphalt restoring 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 hand sprayer application.

Application of emulsified asphalt restoring agent shall be on one-half width of the pavement at a time. When the second half of the surface is treated, the distributor nozzle nearest the center of the road shall overlap the previous application by at least one-half the width of the nozzle spray.

Before spreading, the emulsified asphalt restoring agent shall be blended with water at the rate of 70% emulsified restoring agent to 30% part water, by volume or as specified by the

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manufacturer. The combined mixture of emulsified asphalt restoring agent and water shall be spread at the rate of 0.06 to 0.30 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 or more applications as directed.

After the asphalt restoring 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 for the asphalt restoring agent. When directed by the Engineer, the Contractor shall take representative samples of material for testing.

11.0 SPREADING/ORDERING OF LIME SCREENINGS:

Lime Screenings shall be furnished by the contractor. The contractor shall furnish all equipment, tools, labor and incidentals necessary to perform the sanding operation in accordance with this contract.

Spreading shall consist of applying free flowing 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.

12.0 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 approved methods. If in the opinion of the Engineer, the hand cleaning is not sufficient then a self-propelled street sweeper shall be used.

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All sand used during the treatment must be removed no later than 5 days after treatment of the street or as approved by the engineer. This shall be accomplished by a combination of hand and mechanical sweeping. All turnouts, cul-de-sacs, etc. must be cleaned of any material to the satisfaction of the Engineer. Street sweeping will be included in the price bid per square yard for asphalt rejuvenating agent.

If, after sand is swept and in the opinion of the Engineer a hazardous condition exists on the roadway, the contractor must apply additional sand and sweep same no later than 5 days following reapplication. No additional compensation will be allowed for reapplications and removal of sand.

13.0 TRAFFIC CONTROL & 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, in the opinion of the Engineer, has become complete and the area is suitable for traffic.

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

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

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

14.0 FIELD TESTING

Viscosity testing shall be done on three different streets during the application process. Four (2) cores shall be taken at each location prior to and approximately 60 days following the application of the maltene-based asphalt rejuvenator. Core locations will be determined by the Project Manager and core holes shall be filled with approved mix. The top three-eighths (3/8) inch of each core shall be removed and the asphalt extracted and recovered using California Test Method 365 (CTM 365). Viscosities of the recovered asphalt binder shall be determined using DSR AASHTO T315. The results from the pre-treatment and the post-treatment cores from each street shall be compared and the percent change in each calculated. The average value of the pre-treatment results and the post treatment results will be used to determine the final Viscosity value. No compensation will be made for material not meeting specifications. Test indicating failure to meet the specifications may result in additional tests being required on other streets. No additional compensation will be made for additional testing. Testing shall be performed by an independent third party testing laboratory that has experience with the specified test

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methods and equipment. Testing shall be coordinated with owner's materials testing laboratory and in their presence when cores are extracted or when required by the Project Manager. The owner reserves the right to extract treated cores 1-2 year after rejuvenator application using the previous mentioned test methods

15.0 METHOD OF MEASUREMENT:

The emulsified asphalt restoring agent will be measured by the square yard as provided for in the Contract Documents.