

SECTION 404

BITUMINOUS TREATMENTS

404-1 DESCRIPTION

The work under this Section shall consist of furnishing all materials, and constructing or applying, inclusive of mixing, hauling, sweeping, placing and compacting, a single or multiple course bituminous treatment in conformance with the requirements of these specifications and in reasonably close conformity with the lines shown on the project plans or established by the Engineer.

The kind of bituminous treatment may consist of one of or a combination of the following:

- Tack Coat
- Fog Coat
- Slurry Seal Coat
- Chip Seal Coat

404-2 MATERIALS

404-2.01 Bituminous Materials. The bituminous material shall be of the type and grade specified in the Special Provisions and shall conform to the requirements found in Section 1005.

Application temperature of bituminous materials shall conform to the requirements found in Subsection 1005-3.08.

(A) Bituminous Material for Slurry Seal. Bituminous material for slurry seal shall be a cationic quick setting asphaltic emulsion conforming to the requirements for CQS-1 or CQS-1H grade meeting the requirements of Subsection 1005-3.07.

404-2.02 Aggregate Materials.

(A) General. The contractor shall provide all aggregate material for the work.

Aggregate material will be sampled for gradation acceptance in the final stockpile before incorporation into the work. Samples for all other aggregate characteristics may be collected at the source.

The aggregate material will be deemed to be acceptable when the test values for each specified aggregate characteristic are within the specified limits.

(B) Blotter Material. Blotter material shall be a natural sand, crushed sand, volcanic cinders, or other approved material and shall be free of deleterious amounts of foreign substances.

The grading shall meet the following requirements when tested in conformance with the requirements of Arizona Test Method 201.

| Sieve Size | Percent Passing |
|------------|-----------------|
| 3/8 Inch | 100 |
| No. 4 | 80 - 100 |
| No. 16 | 45 - 80 |
| No. 200 | 0 - 5.0 |

SECTION 404

(C) Cover Materials. Aggregate for cover material shall be a clean sand, gravel or crushed rock and shall be free from lumps or balls of clay and shall not contain calcareous or clay coatings, caliche, synthetic materials, organic matter or foreign substances.

The grading shall meet the following requirements when tested in conformance with the requirements of Arizona Test Method 201.

| Sieve Size | Percent Passing | |
|------------|-----------------|---------|
| | Class 1 | Class 2 |
| 1/2 inch | 100 | ---- |
| 3/8 inch | 70-90 | 100 |
| 1/4 inch | 0-10 | ---- |
| No. 4 | ---- | 0-25 |
| No. 8 | 0-5 | 0-5 |
| No. 200 | 0-1.0 | 0-1.0 |

A representative portion of the cover material will be taken and tested.

The loss on abrasion will be determined in conformance with the requirements of AASHTO T 96 and shall meet the following requirements:

Maximum loss of 9 percent at 100 revolutions.

Maximum loss of 40 percent at 500 revolutions.

The percent of carbonates in aggregate shall be a maximum of 30 when tested in conformance with the requirements of Arizona Test Method 238.

Aggregate crushed faces shall be a minimum of 70 percent when tested in conformance with the requirements of Arizona Test Method 212.

The Flakiness Index shall be a maximum of 25 when tested in conformance with the requirements of Arizona Test Method 233.

The Bulk Oven Dry Specific Gravity shall range from 2.30 to 2.85 when tested in conformance with the requirements of AASHTO T 85.

Water absorption shall range from 0 to 2.5 percent when tested in conformance with the requirements of Arizona Department of Transportation Test Method 210.

(D) Aggregate for Slurry Seal Coat. Aggregate shall conform to the International Slurry Seal Association (ISSA) Guide Specification A-105 for Type II mineral aggregate. The percentage composition by weight of the aggregate shall conform to the following gradation:

| Sieve Size | Percent Passing |
|------------|-----------------|
| 1/8" | 100 |
| #4 | 90 - 100 |
| #8 | 65 - 90 |
| #16 | 45 - 70 |
| #30 | 30 - 50 |

Continued on next page

SECTION 404

| | |
|------|---------|
| #50 | 18 - 30 |
| #100 | 10 - 21 |
| #200 | 5 - 15 |

Ninety percent of the aggregate retained on the No. 50 sieve shall have at least one fractured face produced by crushing. Material passing the No. 50 sieve shall be non-plastic when tested in conformance with ASTM D424. The sand equivalent shall be not less than 45 when tested in conformance with the requirements of Arizona Test Method 807.

404-2.03 Water. Water shall be of such quality that the asphalt will not separate from the emulsion before the slurry seal is placed.

404-2.04 Admixtures for Slurry Seal Coat.

(A) Accelerator. Accelerator shall be Portland cement, Type I. The quantity of Portland cement added to the slurry mix will range between 0.25 percent and 1.5 percent by weight. The exact percentage will be determined by the Engineer, in the field, so as to ensure that the in-place slurry mix has cured adequately to support vehicular traffic within sixty minutes of application.

Portland cement shall be added by an approved method that will assure uniform distribution of the Portland cement throughout the slurry mix.

(B) Mineral Fillers. Mineral fillers such as hydrated lime, limestone dust, fly ash, aluminum sulfate, etc., shall be used only if required to improve the workability or stripping characteristics of the aggregate-emulsion mixture and then only in the minimum amounts necessary. Mineral fillers shall conform to the requirements of ASTM D242 and shall be considered as part of the blended aggregate.

404-2.05 Slurry Seal Coat Mix Design. Trial mixes shall be prepared by the contractor to determine the proportions to be used in the project. The quantity of bituminous material required in the mix can be initially approximated by use of the following formula:

$$P = .03a + .06b + .5c$$

Where: P = Percentage of residual asphalt by weight

a = Percentage aggregate retained on No. 8 sieve

b = Percentage aggregate passing No. 8 sieve and retained on No. 200 sieve

c = Percent of aggregate passing No. 200 sieve

The mix design shall be prepared using the material components to be used by the contractor on the project site.

Testing shall be conducted in conformance with AASHTO T 59, Standard Methods of Testing Emulsified Asphalts and shall consist of the following:

(A) Slurry Seal Mixing Test. To 200 grams of aggregate, inclusive of Portland cement, and conforming to the gradation requirements of Subsection 404-2.02, add 9 percent water, by dry weight of aggregate. To the moistened aggregate add 10 percent, by weight, of quick-setting emulsified asphalt at 70 to 85° F. To be acceptable, the mixture thus obtained shall form a free flowing, smooth, creamy, homogenous slurry with no segregation that is capable of being stirred by hand,

SECTION 404

using a spoon or spatula, without balling or stiffening for a minimum period of two minutes at 70 to 85 degrees Fahrenheit.

(B) Slurry Seal Setting Test. Using approximately three-quarters of the mixture produced in the Slurry Seal Mixing Test, spread the mixture on a section of asphalt-saturated roofing felt to a thickness of 1/4 inch and cure for one hour at 70 to 80 degrees Fahrenheit and 40 percent to 60 percent relative humidity. After this period, a piece of white paper towel shall be pressed lightly on the surface of the slurry. The mixture will be deemed acceptable if no brown stain, exclusive of black asphalt particles, is observed.

(C) Slurry Seal Resistance Test. Using one-quarter of the slurry mixture prepared during the Slurry Seal Mixing Test, spread the mixture on a section of asphalt-saturated roofing felt to a thickness of 1/4 inch and cured for 30 minutes at 70 to 85 degrees Fahrenheit and 40 percent to 60 percent relative humidity. The cured specimen shall be sprayed with tap water in conformance with ASTM D244. The mixture will be deemed acceptable if the runoff water shows no more than a slight discoloration.

(D) Wet Track Abrasion Test. Testing shall be in conformance with the procedures of the International Slurry Seal Association. The maximum wear loss after testing shall be 75 grams per square foot.

404-3 CONSTRUCTION DETAILS

404-3.01 Weather Limitations. Bituminous material used in chip seal coats shall be applied to an existing bituminous surface only when the existing bituminous surface is dry and the ambient temperature is at least 70° F and rising. The application shall cease when the temperature is 75° F and falling.

The slurry seal coat shall be applied only when the existing surface is free from puddles of water. Slurry seal shall not be applied when the pavement is wet and shall be applied only when the atmospheric temperature is at least 45° F and rising, unless otherwise directed.

Despite the required minimum surface temperature and surface condition, the Engineer, at any time, may require that work cease or that the work day be reduced in the event of weather conditions either existing or expected which would have an adverse effect upon the bituminous treatment.

404-3.02 Equipment.

(A) Distributor Truck. Distributor trucks shall be so designed, equipped, maintained and operated that bituminous material at even heat may be applied uniformly on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.03 to 1.0 gallons per square yard, with uniform pressure, and with an allowable transverse variation from any specified rate not to exceed 10 percent or 0.02 gallon per square yard, whichever is less. Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of the tank contents. Distributors shall be equipped with a power unit for the pump, and a spray bar which is adjustable laterally and vertically. The distributor shall provide for continuous circulation of the bituminous material through the tank and spray bar.

Prior to the spreading of bituminous material, all distributor trucks proposed for use shall have been tested for rate of transverse spread in conformance with the

SECTION 404

requirements of Arizona Department of Transportation Test Method 411 and certified within 12 months from the date of spreading. The contractor shall furnish the Engineer with evidence that the distributor provides continuous circulation of the bituminous material through the tank and spray bar, and that the transverse spread of the distributor trucks, when the trucks were approved for use, was as uniform as practicable and under no condition was there a variance on any of the test pads greater than the allowable transverse variation. However, the Engineer, at any time, may require that each distributor truck be tested to determine the rate of the transverse spread.

The rate of transverse spread shall be determined in conformance with the requirements of Arizona Test Method 411.

(B) Power Brooms. Power brooms shall be of the rotary type equipped, maintained and operated so that the bristles are of reasonably uniform length and capable of cleaning without gouging or tearing the surface. Pick-up sweepers also are acceptable for use.

(C) Rollers. Rollers shall be of the oscillating type having a width of not less than 4 feet with pneumatic tires of equal size and diameter and with treads satisfactory to the Engineer. Wobblewheel rollers will not be permitted. The tires shall be spaced so that the gaps between adjacent tires will be covered by the following tires. The tires shall be inflated to 90 pounds per square inch, or such lower pressure as designated by the Engineer, and maintained so that the air pressure will not vary more than 5 pounds per square inch from the designated pressure. Pneumatic tired rollers shall be constructed so that the total weight of the compactor can be varied to produce an operating weight per tire of not less than 2,000 pounds. The total operating weight of the roller shall be varied as directed by the Engineer.

For slurry seal coats, steel wheel rollers may be used to supplement pneumatic tired rollers with the approval of the Engineer.

(D) Aggregate Spreaders. The application of cover material shall be accomplished by means of a calibrated spreader. The aggregate spreader shall be a self-propelled, computerized rate-controlled unit capable of an application width of 14 feet or greater.

The spreader shall be in good mechanical condition and capable of applying aggregate uniformly across the spread width.

Aggregate spreaders shall be equipped with positive controls so that the required amount of material will be deposited uniformly over the full width of the bituminous material. Aggregate application rates are expected to vary from 4 to 40 pounds per square yard, depending on the type of construction.

Where it is necessary to apply aggregate at a rate less than 4 pounds per square yard, other means such as a sand slinger may be used with the approval of the Engineer.

Application of blotter material shall be accomplished by means of a sand slinger or other equipment approved by the Engineer.

(E) Slurry Seal Mixer. The slurry mixing machine shall be a continuous flow mixing unit and be capable of delivering accurately a predetermined proportion of aggregate, water, and asphalt emulsion to the mixing chamber and to discharge the thoroughly mixed product on a continuous basis. The aggregate shall be pre-wetted immediately prior to mixing with the emulsion.

SECTION 404

The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients together. No excessive mixing shall be permitted.

The mixing machine shall be equipped with an approved fines feeder that provides an accurate metering device or method to introduce a predetermined proportion of mineral filler into the mixer at the same time and location that the aggregate is fed. The fines feeder shall be used whenever added mineral filler is a part of the aggregate blend.

The mixing machine shall be equipped with a water pressure system and fog type spray bar adequate for complete water fogging of the surface preceding spreading equipment with an application of 0.05 to 0.10 gallon per square yard. A calibrated control for both aggregate and asphalt emulsion shall be provided and capable of accurately proportioning these materials.

Sufficient machine storage capacity to properly mix and apply a minimum of 5 tons of the slurry shall be provided. Proportioning devices shall be calibrated prior to placing slurry seal.

The mixer shall be capable of rapid discharge of the mixed materials into a spreader.

(F) Slurry Seal Spreading Equipment. Attached to the mixer machine shall be a mechanical type squeegee distributor equipped with flexible material in contact with the surface to prevent loss of slurry from the distributor. It shall be maintained to prevent loss of slurry on varying grades and crown by adjustments and baffles to assure uniform spread. The equipment shall be capable of a minimum speed of 60 feet per minute and shall not exceed 180 feet per minute while placing slurry. There shall be a lateral control device and a flexible strike off. The spreader box shall have an adjustable width. The box shall be kept clean, and built-up asphalt and aggregate on the box shall not be permitted. The use of burlap drags or other drags may be approved by the Engineer.

Squeegees, shovels and other hand equipment shall be available.

404-3.03 Traffic Control. In the construction or application of a bituminous treatment, the treated roadway surface shall not be used by the contractor, its agents, or others until it has been established to the satisfaction of the Engineer that the treated roadway surface will not be damaged or marred under the action of the traffic. No traffic of any description shall be allowed on any bituminous application until approved by the Engineer. The contractor shall erect and maintain approved barricades, signs and other traffic control devices and shall use every possible means to protect the work and to exclude traffic from the roadway surface for as long a time as may be required. Traffic shall be handled in the manner most convenient to the traveling public. When traffic is handled on a one-way basis, the contractor shall provide such flagmen and pilot trucks as deemed necessary to ensure adequate protection for the roadway surface. Traffic may be detoured around the work, provided that detours are constructed and maintained in a satisfactory manner and properly signed. When it is necessary to provide for traffic across a bituminous treated surface, the crossing shall be blotted with material, as directed, before the crossing is opened to traffic.

404-3.04 Preparation of the Surface. The surface to be treated shall be thoroughly cleaned and patched as required by the project plans, the Special Provisions, or as directed by the Engineer prior to applying the bituminous material or slurry seal coat. The contractor shall inspect the surface to be treated

SECTION 404

and shall satisfy himself as to the extent of the cleaning work required and the type of equipment that will be necessary to clean the surface.

When the work consists of a chip seal coat or when blotter material is applied, self-propelled rotary power brooms or pick-up sweepers along with hand brooms, if necessary, shall be used immediately in advance of applying the bituminous material.

When a bituminous treatment is to be applied to an existing aggregate surface, the surface shall be uniformly smooth, firm and reasonably true to grades and cross sections as shown on the project plans, and shall be so maintained throughout the placing of the bituminous treatment. In no event shall a bituminous treatment be placed on a soft, uneven base. Any holes, depressions or irregularities shall be repaired. All loose and unsuitable material shall be removed and replaced by suitable material, which shall be compacted to produce a dense surface conforming to the adjacent area. Uniformity of surface texture is of the utmost importance.

When required, the existing aggregate surface on which the bituminous treatment is to be placed shall be lightly bladed, watered and compacted immediately prior to the application of bituminous material. In extremely dry areas, additional light applications of water may be required prior to the application of the bituminous material to facilitate penetration of the bituminous material.

404-3.05 Application of Bituminous Material. The types, grades and approximate rates of application of bituminous material will be specified in the Special Provisions.

The Engineer will specify the exact rates of application based on the surface to be treated and the characteristics of the aggregate material. The rates to be applied may vary substantially because of different surface conditions within the project limits. The actual bituminous material application shall not vary more than 10 percent from the application rate specified by the Engineer.

The bituminous material shall be uniformly applied to the prepared surface at the rate specified by the Engineer and in one application.

The various types or grades of bituminous materials shall be mixed with materials or applied at temperatures within the limits given in Section 1005 and at no time shall the contractor increase the temperature of the bituminous material above the higher limit specified.

In order to obtain uniform distribution, the application shall be promptly started or stopped at the junction of a previously placed coat in a manner that will not result in overlaps or gaps in the applications. If required by the Engineer, a strip of building paper, at least 3 feet in width and with a length equal to that of the spray bar of the distributor plus 1 foot shall be used at the beginning of each application. The paper shall be removed and disposed of in a satisfactory manner.

Application of bituminous material shall be promptly cut off prior to a decrease in uniform flow caused by the distributor tank becoming empty, when there is a decrease in uniform flow due to any reason whatever, or when the forward movement of the distributor slows down or stops.

In the event that any spots are missed in the application or any areas develop that do not have a uniform spread or penetration, such areas shall be remedied without unnecessary delay as directed. The length of spread of bituminous material shall

SECTION 404

not be in excess of that which a truck loaded with cover material can immediately place or which can be satisfactorily compacted.

Manhole covers, catch basins, water valves, survey monuments and any other structure within the roadway areas shall be protected against the application of bituminous materials.

Care shall be taken to prevent the spraying or splattering of bituminous material on adjacent pavements, structures, curb, gutter, guard rail, trees and shrubbery or any other object outside of the area designated for spraying. The distributor, when not in use, shall be parked so that the spray bar or mechanism will not drip bituminous material on the surface of the roadway.

Damage caused by application of bituminous material to unintended areas or features shall be removed to the satisfaction of the Engineer at no additional cost to the Agency.

Unused bituminous material shall not be disposed of within the right-of-way lines.

404-3.06 Application of Cover Material. The approximate amount of cover material, when required as part of a bituminous treatment, will be specified in the Special Provisions; however, the contractor will recommend and the Engineer will approve the exact rate to be applied based on the characteristics of the aggregate material and the surface to be treated.

Cover material shall be immediately and uniformly spread over the freshly applied bituminous material by means of an aggregate spreader meeting the requirements specified in Subsection 404-3.03(D).

Any oversize aggregate or foreign material picked up during stockpiling or loading operations shall be eliminated before entering the aggregate spreader hopper. Supplemental spreading and smoothing shall be done by hand methods where necessary.

Spreading shall be accomplished in such a manner that the tires of the trucks or aggregate spreader at no time shall contact the uncovered and newly applied bituminous material.

When emulsified asphalt is used, the cover material shall be wet but free of running water at the time of spreading. When bituminous material other than emulsified asphalt is used, the cover material, at the time of spreading, shall be at least as dry as material dried to a saturated surface dry condition in conformance with the requirements of Arizona Department of Transportation Test Method 210.

404-3.07 Mixing of Slurry. The mixing shall be sufficient to produce a uniform mixture, but it shall not continue for more than 4 minutes. If breaking, hardening, segregation, balling, or lumping occurs during the mixing process, the batch shall be discarded.

404-3.08 Application of Slurry Seal. No slurry mix shall be spread if there is a possibility of rain before the mix has dried, or during periods of abnormally high humidity.

The surface shall be fogged with water directly preceding the spreader. The slurry mixture shall be of the desired consistency when deposited on the surface and no additional elements shall be added. A sufficient amount of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained.

SECTION 404

No segregation of the emulsion and aggregate fines from the coarse aggregate will be permitted. No streaks such as caused by oversized aggregate will be left in the finished pavement. No excessive build-up or unsightly appearance shall be permitted on longitudinal or transverse joints. Approved squeegees shall be used to spread slurry in areas inaccessible to the slurry mixer. Care shall be exercised in leaving no unsightly appearance from hand work. Treated areas will be allowed to cure until such time as the inspector in charge permits their opening to traffic.

The beginning and end of the slurry application shall present a straight line perpendicular to the centerline of the existing pavement.

404-3.09 Rolling Cover Material. Following the spreading of cover material, the surface shall be promptly rolled with self-propelled pneumatic tired compactors. A sufficient number of compactors shall be provided to cover the full width of the material spread in one pass of the compactors and this rolling shall continue until a minimum of three passes has been completed.

404-3.10 Rolling Slurry Seal Coat. As soon as the asphalt slurry has set sufficiently to prevent any material being picked up, it shall be rolled by a minimum of 4 complete coverages, as directed. Rolling shall continue until all ridges have been ironed out and a uniformly smooth surface is obtained. The slurry seal shall be protected from traffic by barricades and markers until it has dried adequately to prevent marring from traffic.

404-3.11 Removing of Loose Cover Material. All loose cover material shall be removed from the paved surface by brooming. Brooming shall commence upon approval of the Engineer with commencement of brooming occurring within 36 hours after application; unless, due to weather conditions, temperature or other reasons, the Engineer determines that conditions are not conducive to obtaining the best results, in which case brooming shall be discontinued until the Engineer has considered all conditions and has determined the best time for removal of the cover material.

The cover material shall be removed by means of a power broom which shall be in good condition and of a design suitable for the work. The action of the broom shall be such that particles which are stuck to the bituminous material will not be dislodged.

404-3.12 Application of Blotter Material. The approximate amount of blotter material, when required as a part of a bituminous treatment, will be specified in the Special Provisions; however, the Engineer will specify the exact rate to be applied based on the characteristics of the bituminous treated surface.

Blotter material, at the time of spreading, shall be moist but free from running water.

Blotter material shall be spread uniformly to the satisfaction of the Engineer. Any oversize aggregate or foreign material picked up during stockpiling or loading operations shall be eliminated before entering the spreader. Supplemental spreading or smoothing shall be done by hand methods where necessary.

Prior to final acceptance and when directed by the Engineer, the contractor shall remove and dispose of any excess blotter material. The method of removal and the disposal of any excess blotter material shall be the contractor's responsibility.

404-3.13 Joints. Transverse joints with the preceding work, at intersections and at all existing pavements and structures shall be made by a method approved by the Engineer prior to the start of the work.

SECTION 404

Longitudinal joints shall be butt joints.

Joints shall be cleaned as deemed necessary by the Engineer prior to the application of bituminous material in the adjacent strip.

Regardless of the width of the roadway to be sealed, the number of longitudinal joints shall be kept to a minimum and shall be located to the greatest degree possible so that they will coincide with painted lines between traffic lanes.

404-3.14 Tack Coat. Tack coat shall be applied prior to placing a bituminous mixture to an existing bituminous surface or to an existing Portland cement concrete pavement surface. A tack coat also may be applied between layers of bituminous mixed materials when directed by the Engineer.

Unless otherwise stated in the Special Provisions, the contractor shall furnish liquid asphalt, Type CSS-1, CSS-1h, SS-1 or SS1h conforming to the requirements of Section 1005 for tack coat. The tack coat shall be uniformly applied at an appropriate rate as approved by the Engineer.

The type, grade or designation, and the rate of application for the specific usage will be specified by the Engineer. The following table indicates the various types of material from which the Engineer may select the tack coat and the approximate application rates:

| Type, Grade or Designation | Approximate Application Rates: Gallons / Square Yard | Payment Factor |
|--|---|-----------------------|
| Emulsified Asphalt (Special Type) | 0.12 | 0.7 |
| Emulsified Asphalt (Other than Special Type) | 0.08 | 1.0 |
| Asphalt Cement (Grade Specified by Engineer) | 0.06 | 1.0 |

If emulsified asphalt of any designation or type is used it shall have broken before asphaltic concrete is placed. If held overnight, the emulsified asphalt shall be reheated and agitated prior to further application.

The Engineer may either reduce the rate to be applied or, except as specified below, eliminate the use of tack coat in any part of the work if, in the Engineer's judgment, the bituminous mixed material to be placed will be effectively bonded to the underlying surface.

Bituminous material shall be applied only as far in advance of the placement of the bituminous mixed materials as is necessary to obtain the proper condition of tackiness. In no event shall more bituminous material be applied in one day than will be covered by bituminous mixed materials during that same day.

404-3.15 Chip Seal Coat. The type of bituminous material shall be CRS-2. Unless otherwise specified in the Special Provisions, or directed by the Engineer, bituminous material shall be applied at the following rate:

Single Application 0.42 gal/SY

Double Application (on primed Aggregate base course) 0.30 gal/SY

When asphaltic-rubber material is to be applied, the rate of application and other requirements shall be in conformance with the Special Provisions.

SECTION 404

Cover material shall be applied at the rate of approximately 0.01 cubic yard per square yard or approximately 24 pounds per square yard. The Engineer, however, will specify the exact rate to be applied based on the characteristics of the aggregate material and the surface to be treated.

The contractor shall submit a minimum 75 pound sample of cover material to the Engineer for testing at least 10 calendar days prior to beginning application of the cover material.

Chip seal coat shall be placed from March 15 to May 31 and September 1 to October 31 unless otherwise specified in the Special Provisions or approved, in writing, by the Engineer.

The minimum traffic free period for a newly applied chip seal coat shall be three hours; however, the contractor's hauling equipment may use the new seal coat during the traffic free period at a speed not to exceed 15 miles per hour. After the traffic free period, yet prior to removing the loose material, all traffic allowed by the Engineer shall be limited to a speed not to exceed 25 miles per hour.

404-3.16 Fog Coat. The type of bituminous material and the approximate application rate shall be as specified in the Special Provisions. The material shall be diluted with one part water to one part emulsified recycling agent.

Blotter material shall be applied to the treated surface in one or more applications for a total application as specified in the Special Provisions at a time specified by the Engineer and before opening to traffic.

404-4 METHOD OF MEASUREMENT

Bituminous treatments will be measured for payment by the ton of bituminous material and, unless otherwise specified in the Special Provisions, by the ton of cover material.

Measurement for payment will be made only for the quantity of bituminous material and the quantity of cover material used in conformance with the requirements of these specifications.

Bituminous material that is required to be diluted prior to application will be measured for payment by the ton of diluted material.

Cover material, when specified, will be measured for payment by the ton of aggregate material. The weight of all moisture contained in the cover material will be deducted.

The specific gravity of cover material varies from one source to another. The contractor shall be responsible for determining the amount of cover material that will be required to complete the work from the source or sources from which the cover material is obtained.

No direct measurement shall be made for admixtures for slurry seal coats, as specified in Subsection 404-2.04, the cost being considered as incidental to and included in the payment for slurry seal coats.

404-5 BASIS OF PAYMENT

The accepted quantities of bituminous treatments, of the type specified in the bidding schedule, measured as provided above, will be paid for at the contract unit price indicated in the bidding schedule, except that adjustments in the contract unit price, in conformance with the provisions of Tables 110-3 and 110-4,

SECTION 404

will be made for the quantity of material represented by test samples whose test results fall within the deviation ranges shown in Tables 110-3 and 110-4.

For emulsified bituminous materials which have a specified minimum percent residue, the emulsified product incorporated into the work which does not meet this minimum will be subject to an adjustment, to the nearest cent, in the contract unit price. The adjusted unit price for material which does not meet this minimum will be determined by multiplying the contract unit price by the value, to the nearest hundredth, obtained by dividing the residue obtained by testing by the specified minimum residue.

An adjustment to the unit price of the bituminous material, of any type, incorporated into the work under this Section, shall be in conformance with the provisions of Subsection 406-5.01. For the purpose of the adjustment, the percent of bituminous material upon which the adjustment will be based shall be the actual asphalt content of the bituminous material.

Payment for all measures necessary to direct and escort traffic through the area being bituminous treated will be made as specified under Section 701.

No separate payment will be made for rolling, furnishing, applying and removing blotter material, furnished in conjunction with the application of a prime coat, maintenance or repair of a prime coat surface or for admixtures used in slurry seal coats. The cost of the elements is considered as incidental to and included in the payment for the contract items in the bidding schedule into which these elements are incorporated.

The unit price bid for bituminous tack coat is deemed to be the cost to furnish, transport, store and apply emulsified asphalt of any designation at the project location. Payment for bituminous tack coat will be made at the contract unit price.

The bidding schedule quantity for bituminous tack coat is based on an estimated application rate of 0.06 gallon per square yard for each application shown on the project plans.

Payment for bituminous tack coat will be made at the unit price multiplied by the respective payment factor listed under Subsection 404-3.14, and adjusted to the nearest dollar.

Unless otherwise specified, the accepted quantity of bituminous tack coat, measured as provided above, will be paid at the contract unit price per ton, adjusted as provided above, which price shall be full compensation for furnishing, transporting, and storing the exact type, grade or designation of bituminous tack coat specified in the Special Provisions or by the Engineer.

Should the items of prime coat or tack coat be eliminated, they will be eliminated in conformance with the requirements of Subsection 109-5; however, no reimbursement will be made for any costs which the contractor may have incurred in anticipation of their use.

Payment under this Section will be considered as compensation, in full, for the applicable bidding schedule item complete in place including all labor, equipment, materials, tools, supplies and incidentals necessary for the work in conformance with the requirements of this Section, the project plans, Special Provisions or as may be directed by the Engineer.