

# ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: February 5, 2015

Special Provision No. 12-1351

SUBJECT: Triple Layer Bituminous Surface Treatment,  
Project No. ACNU59654-ATRP(002), Lawrence County

Alabama Standard Specifications, 2012 Edition, shall be revised by adding a new SECTION 409 as follows:

## SECTION 409 TRIPLE LAYER BITUMINOUS SURFACE TREATMENT

### 409.01 Description

#### (a) GENERAL.

This Section covers the materials, equipment, construction, and application procedures for placing three applications of bituminous materials and aggregate for surfacing previously prepared bases or existing paved surfaces.

Bituminous materials shall be placed within the tolerance specified, unless otherwise ordered by the Engineer in writing. Any variation outside of the designated limits shall be cause for ordering the treatment to be removed and replaced or corrected as directed by the Engineer, all without additional cost to the Department.

The rate of aggregate coverage shown by the table is the approximate rate found to produce an acceptable coverage when properly applied. Regardless of the rate shown, the Contractor shall provide aggregate in sufficient quantities and so spread the aggregate that the bitumen is uniformly and evenly covered.

The Engineer will notify the Contractor in writing should it become advisable to change the amounts of any material from the limits specified in the table. In such event an adjustment in the contract unit price will be made as specified in Subarticle 409.06(a).

### 409.02 Materials.

All materials shall comply with the requirements of Division 800, Materials, except as noted herein. Special reference is made to the following:

#### (a) BITUMINOUS MATERIALS.

The Contractor shall have the option of the following material for the triple layer surface treatment:

- CRS-2p
- CRS-2hp
- CRS-2l

CRS-2p, CRS-2hp, and CRS-2l shall meet the requirements given in Article 804.03 and Subarticle 804.07(e).

#### (b) AGGREGATE.

Coarse aggregates for bituminous surface treatments shall be crushed aggregate meeting the requirements of Section 801 and Section 802. The kind of aggregate materials used shall be at the Contractor's option within the following limits:

1. The use of carbonate stone such as limestone, dolomite, or aggregate tending to polish under traffic shall be restricted as follows, based on the average daily traffic (ADT) count in both directions:

≤ 500 vehicles per day - No restrictions apply.

> 500 but ≤ 1,000 vehicles per day - Carbonate stone shall not be used in the final application. Aggregates for the final application (wearing layer) shall be limited to siliceous aggregates such as granite, quartzite, blast furnace slag or lightweight aggregates (expanded clays or shales produced by the Rotary Kiln Method).

> 1,000 vehicles per day - Carbonate stone shall not be used in any application.

The above will not apply to shoulder surfacing or detours, or to bituminous surface treatments which are to be covered over with a bituminous plant mix layer.

2. Crushed gravel may be used for all applications which are to be covered with a bituminous plant mix layer, for all applications on roads having an average daily traffic count (ADT) of less than 1500 vehicles, and for all applications of shoulder surface treatment work.

3. Layer 3 shall be a washed manufactured sand meeting the following gradation:

Aggregate Size Number	Description	Percent Passing By Weight, Sieve Size						
		3/8 inch	No. 4	No.8	No. 16	No. 50	No. 100	No. 200
W-10	Manufactured Sand	100	95-100	-	45-95	8-30	1-10	0-4

#### 409.03 Construction Requirements.

##### (a) EQUIPMENT.

In general, it shall be the Contractor's responsibility to select the proper sizes and amount of equipment to provide the desired results, but as a minimum the following basic items given below shall be provided. In addition, all equipment necessary for the proper execution of the work shall be assembled on the site and must be approved and in good working order before permission to start any treatment will be given.

All equipment approved for use shall be on a trial basis, and if after a short test section the equipment proves to be unsatisfactory, it shall be removed, replaced, or supplemented as necessary to accomplish the desired results.

##### 1. CLEANING EQUIPMENT.

Cleaning equipment shall be capable of cleaning the surface thoroughly without cutting, tearing, or otherwise damaging the surface.

##### 2. PRESSURE DISTRIBUTOR.

A pressure distributor shall be required and shall be so designed and operated that it will distribute the contents, at a pressure between 30 psi {200 kPa} to 75 psi {500 kPa}, in a uniform spray for the full width of the treatment area without atomization, at the rate and within the limits specified. Distributors shall be equipped with a tachometer to indicate the application rate. Heating equipment shall be provided. Distributors shall be capable of circulating or agitating the bitumen throughout the heating process providing a uniform temperature, within the ranges specified herein, and suitable means shall be provided for determining such temperatures. Suitable measuring equipment for accurately measuring the volume in gallons of the bituminous materials before and after application shall be provided. The distributor shall be equipped with a spray bar of adjustable height, hand hose, and nozzle.

##### 3. AGGREGATE SPREADER.

A self-propelled aggregate spreader with mechanically actuated spreading attachments and adjustable widths of satisfactory design and performance will be required; however, when the area to be processed is of such size or shapes that to require the use of a mechanical spreader would be impractical, the Engineer may permit the aggregate to be spread manually.

##### 4. ROLLERS.

A self-propelled steel wheel roller having a weight {mass} between 3 tons {3 metric tons} and 8 tons {7 metric tons} shall be required immediately behind the aggregate spreader followed by a self-propelled pneumatic tired roller. The Contractor shall ensure that the roller weights within these limits can properly seat the aggregate without fracturing the aggregate. Only one coverage shall be made with the steel wheel roller.

A self-propelled, two axles, pneumatic-tired rollers with smooth-tread rubber tires aligned such that gaps between the tires on one axle are covered by the tires of the other axle shall be required. The Contractor shall ensure that all tires are of the same size and ply rating and inflated to a minimum of 60 psi {415 kPa}. The Contractor shall maintain tire pressure such that the difference in pressure between any two tires does not exceed 5 psi {35 kPa}.

(b) TEMPERATURE AND WEATHER LIMITATIONS FOR PLACEMENT OF SURFACE TREATMENTS.

All bituminous treatments shall be applied in strict conformity with the following:

1. SEASONAL

No Bituminous Surface Treatment, which will be exposed to traffic, including shoulder paving, shall be placed between the dates of October 1 and May 1 in North Alabama and between the dates of November 1 and April 1 in South Alabama regardless of weather conditions. For the purpose of identification, South Alabama shall be referred to for projects lying partly or wholly in the area of the State lying south of latitude 33°N and with North Alabama encompassing the remaining or northern portion of the State.

2. WEATHER.

Bituminous surface treatments shall not be placed on a wet surface or when the Engineer will not allow the placement due to existing unfavorable weather conditions. They shall not be placed when the temperature is expected to fall below freezing during the night regardless of daytime temperature, when the ground is frozen, or when the surface temperature is less than 32°F {0°C}.

Triple Layer Bituminous Surface Treatment shall not be placed when the air temperature is below 60 °F {15°C}. The above limitations shall not be waived unless approved in writing by the Engineer.

All three layers of the bituminous surface treatment shall be placed prior to allowing traffic on the new surface when the air temperature is equal to or greater than 95°F {35°C} and the relative humidity is 85% or greater

3. MOISTURE IN AGGREGATE.

Aggregates spread when the temperature is 70 °F {20°C} and above may be surface damp but not wet. Aggregates spread when the temperature is below 70 °F {20°C} shall be surface dry. Aggregates found by the Engineer to contain excessive moisture or free water at the time of use shall be rejected.

The above limitations shall not be waived unless approved in writing by the Engineer.

(c) PREPARATION OF EXISTING SURFACE.

Loose material, dust, dirt, caked clay, or any foreign material shall be removed. Cleaning shall be continued until the surface is clean or, in case of application on a soil or aggregate surface, all the loose dirt is removed and the surfaces of the larger size aggregate in the road surface are exposed but not dislodged. All cleaning of the area to be treated shall be completed before any bituminous material is applied.

(d) APPLICATION OF BITUMINOUS MATERIAL.

1. GENERAL.

No bituminous material or treatment shall be applied until the base or underlying surface has been approved.

2. PREPARATION OF BITUMINOUS MATERIAL.

Bituminous materials used for each treatment shall be heated as previously noted. The material shall be maintained within the specific temperature range during application. Any material which has not been maintained within the specified range shall be rejected. The application temperature (°F {°C}) range for the Emulsified Asphalt with polymer additive shall be 140 °F - 180 °F {60°C - 80°C}.

The bitumen shall be applied uniformly over the area to be treated. Where the treatment width is 26 feet {8 m} or less, the entire width shall be treated in one application, unless otherwise directed. Where only a partial width is treated in one application, extreme care shall be used to insure a slight overlap of adjacent treatments, but not in excess of 4 inches {100 mm}.

The spray bar shall be adjusted to the proper height for exact single or double overlap of spray area without partial overlap. Uniformity of discharge shall be checked before beginning

application and at other times as directed by the Engineer. Streaked areas and any other areas lacking uniform distribution shall immediately be made uniform. In all cases the distributor shall be stopped before the application begins to run light (just before the distributor tank is completely empty). A method of making joints shall be used that will insure that in beginning and ending the distribution of each load, a proper junction is made with the preceding and succeeding work without excessive bituminous material at the joints.

In applying bituminous materials, the Contractor shall use effective means to protect structures, walls, curbs, etc. from discoloration or spattering.

**3. APPLICATION OF BITUMINOUS MATERIALS.**

Rates of application for each layer shall be as follows:

Layer	Gallons {Liters} of Bituminous Material per square yard {m <sup>2</sup> } of Treatment
	CRS-2p CRS-2hp CRS-2l
1	0.23 - 0.32 {1.04 - 1.45}
2	0.20 - 0.26 {0.91 - 1.18}
3	0.20 - 0.26 {0.91 - 1.18}

**(e) SPREADING AND EMBEDDING AGGREGATE.**

The aggregate stone size and application rate of aggregates used shall be as follows:

Layer	ALDOT Stone Size	Application Rate cu.ft./sq.yd. {m <sup>3</sup> /m <sup>2</sup> }
1	7	0.18 - 0.26 {0.006 - 0.009}
2	89	0.16 - 0.22 {0.005 - 0.007}
3	W 10	0.10 - 0.14 {0.003 - 0.005}

Spreading of aggregate shall follow application of bituminous material as closely as practicable using mechanical aggregate spreaders; inaccessible areas shall be covered as directed. Sufficient aggregate to cover each distributor load, in loaded trucks along with an adequate crew of workmen equipped with brooms standing by, shall be at the site before bituminous application begins.

Spreading of the aggregate shall begin and continue immediately behind the application of the bituminous material.

Rolling shall begin immediately behind the spreading operation. Sufficient rollers shall be furnished to insure that the initial pass of the roller is made immediately behind the spreading of the aggregate. Rolling shall be continuous, providing coverage of the entire area of treatment a minimum of three (3) passes for each layer of aggregate to insure thorough embedment of the aggregate.

Unless a sufficient number of rollers are in operation to complete the above requirement, the next load of bituminous material shall not be applied until the rolling of the previous application is completed.

When the Engineer determines the aggregate has been thoroughly embedded, rolling shall cease and the Contractor shall, without delay, remove all excess aggregate from the treatment area.

The Contractor shall stage his day's work such that all three layers are placed at the end of each day's work.

**409.04 Maintenance and Protection of Surface and Traffic.**

Maintenance shall include immediate repair of any failures or defects that occur, repeated as often as is necessary to keep the surface continuously intact and acceptable. Maintenance shall be performed without direct compensation.

Unless otherwise specified on the plans or in the proposal, the Contractor shall handle traffic through the work and over the surface except while bituminous material is actually being applied and covered with aggregate. It shall be his responsibility to take whatever steps are necessary or directed to protect both the work and the traveling public. Both the first application layer and the second application layer shall be completed before opening the road to traffic. Traffic control shall be established such that traffic is not allowed to sit on the newly applied bituminous surface treatment.

**409.05 Method of Measurement.**

Measurement will be made of the number of square yards {square meters} of accepted triple layer bituminous treatment, complete in place.

The length shall be the actual length measured along the surface of the treatment. The width shall be the designated width of completed surface. Where the pay item specifies a prime coat plus an overlying treatment, the measurement will not include the additional width of the prime coat.

**409.06 Basis of Payment.**

**(a) UNIT PRICE COVERAGE.**

Payment for accepted triple layer bituminous surface treatment, Pay Item No. 409-A Triple Layer Bituminous Treatment, measured as provided above, will be paid for at the contract unit price per square yard {square meter} complete in place; except that adjustments in the contract unit price shall be made as follows: When changes in amounts of treatment materials are ordered as provided in Article 409.01, the contract unit price will be adjusted upward or downward accordingly. Adjustment will be based on the increase or decrease in amounts per square yard {square meter}, at the verified cost, f.o.b. delivery point plus 2 cents per gallon {0.5 cent per liter} for the bitumen, and the verified cost per square yard {cubic meter} for the aggregate delivered to the spreader. The contract unit price or adjusted contract unit price for the accepted area complete in place shall be payment in full for furnishing all material, placement of materials, maintenance thereof and for all equipment, tools, labor, and incidentals necessary to complete the work.

**(b) PAYMENT WILL BE MADE UNDER ITEM NO.:**

409-A Triple Layer Bituminous Treatment,  
- per square yard {square meter}