

<b>OFFICE OF STATE AID ROAD CONSTRUCTION</b>			S.O.P. NO. SA II-1-91
<b>STANDARD OPERATING PROCEDURES</b>			Page 1 of 4
Subject: S.O.P. SEAL COATS AND BITUMINOUS SURFACE TREATMENTS			Distribution A, B, C, D, E
EFFECTIVE  July 1, 2005	ISSUED  July 1, 2005	SUPERSEDES Page 1 of 4  S.O.P. NO. SA II-1-91  EFFECTIVE: April 15, 2000	APPROVED  J. Brooks Miller, Sr.  STATE AID ENGINEER

**PURPOSE:** To Establish Uniform Policies And Procedures For The Application of Seal Coats and Bituminous Surface Treatments.

**REFERENCE:** Section S-410 of the Standard Specifications.

1. SEAL COATS:

A seal coat consists of applying a bituminous material, at a specified rate per square yard, upon an existing bituminous surface and placing a single, uniform application of cover aggregate on the bituminous material. The cover aggregate is then promptly embedded in the bituminous material by rolling. Seal coats are used to lengthen the service life of an existing pavement surface by waterproofing and improving the texture of the surface.

2. BITUMINOUS SURFACE TREATMENTS:

Surface treatments are similar to seal coats except that they usually consist of double or triple applications of bituminous material and aggregate. They are usually applied to a prepared non-asphaltic base and are for the purpose of waterproofing the base and protecting it from the abrasive action of traffic. In a double surface treatment, the first treatment of "mat" consists of coarse cover aggregate spread uniformly on the bituminous material. The second treatment consists of applying bituminous material to the "mat" and then spreading seal cover aggregate. On a triple surface treatment a third application of bituminous material and a smaller seal cover aggregate is spread.

3. MATERIALS:

All materials must be inspected and tested for compliance with the requirements of the specifications prior to their use.

Aggregate will be tested and approved at the job-site. The inspector should assure himself that all necessary tests have been performed.

The inspector should inspect each load of aggregate visually for cleanliness and segregation. Dirty or dusty stone should not be used until the results of a retest are known. Dust prevents proper adherence of the asphalt to the aggregate.

<b>OFFICE OF STATE AID ROAD CONSTRUCTION</b>			S.O.P. NO. SA II-1-91
<b>STANDARD OPERATING PROCEDURES</b>			Page 2 of 4
Subject: S.O.P. SEAL COATS AND BITUMINOUS SURFACE TREATMENTS			Distribution A, B, C, D, E
EFFECTIVE  July 1, 2005	ISSUED  July 1, 2005	SUPERSEDES Page 2 of 4  S.O.P. NO. SA II-1-91  EFFECTIVE: April 15, 2000	APPROVED  J. Brooks Miller, Sr.  STATE AID ENGINEER

4. SEASONAL AND WEATHER LIMITATIONS:

The weather is an important factor that must be considered when constructing bituminous surfaces. Construction operations should not proceed when the existing surface is wet, when it is foggy, raining or threatening rain, or when the air temperature is below that specified in Subsection S-410.07. Refer to Subsection S-410.07 for seasonal limitations.

5. EQUIPMENT:

The equipment required for seal coats and surface treatments is listed in Subsection S-410.08. The inspector should assure that all required equipment is on the project and in proper working order before seal or surface treatment operations begin.

6. CONSTRUCTION METHODS:

The construction operations are very important in seal and surface treatment work. Since each existing roadway surface can be different, it is important that the County Engineer and the Contractor evaluate each surface prior to application of liquid asphalt to determine if the application rate(s) shown on the plans will be adequate. Even the most precise planning and design will be of no value if the construction operations are not properly carried out, such as:

6.1. Cleaning the Surface: The existing surface should be thoroughly cleaned in compliance with Subsection S-410.09 of the Standard Specifications.

6.2. Traffic Control: Traffic control is essential to the construction of this type surface. Traffic must be controlled in such a manner that interruption and damage to the work will be avoided, that construction personnel will be protected, and that the traffic itself will be protected from hazards created by the construction operations.

6.3. Application of Bituminous Material: Refer to Subsection S-410.10 of the Standard Specifications.

6.3.1. Just prior to the application of the bituminous material, the quantity of material in the distributor tank should be determined. For this determination the distributor should be parked with the tank in a level position. After application of the bituminous material has been made, the quantity of material remaining in the distributor should be determined.

<b>OFFICE OF STATE AID ROAD CONSTRUCTION</b>			S.O.P. NO. SA II-1-91
<b>STANDARD OPERATING PROCEDURES</b>			Page 3 of 4
Subject: S.O.P. SEAL COATS AND BITUMINOUS SURFACE TREATMENTS			Distribution A, B, C, D, E
EFFECTIVE  July 1, 2005	ISSUED  July 1, 2005	SUPERSEDES Page 3 of 4  S.O.P. NO. SA II-1-91  EFFECTIVE: April 15, 2000	APPROVED  J. Brooks Miller, Sr.  STATE AID ENGINEER

- 6.3.2. The pay quantity of bituminous material is to be based on the volume in gallons at 60°F. Therefore, the actual temperature of the material in the tank must be determined. Volume Correction Factors obtained from applicable tables multiplied by the gallons measured will yield the actual gallons used at 60°F. Tables are found in S.O.P. No. SA II-3-11.
- 6.3.3. Due to the fact that bituminous materials cool rapidly distribution should be coordinated with spreading of the cover aggregate. The time lapse between the distribution of the bituminous material and the application of the cover aggregate should be kept to an absolute minimum in order to obtain greater coating action and hence better bond with aggregate.
- 6.3.4. The transverse joints on seal coats and on surface treatments should be carefully made so that they will not be rough and unsightly. This can be done successfully by starting and stopping each application of bituminous material and cover aggregate on a sheet of building paper.
- 6.3.5. The longitudinal joints for seal coats and surface treatments which are not placed to the full width of the roadway in a single pass should also be carefully controlled. Since it is not practical to use building paper on these joints, it is considered better to have a slight buildup due to overlapping the adjacent passes than to have a gap in the surface.

The length of "shot" to be made depends both on the capacity of the distributor and the volume of the aggregate trucks available. Assume for example:

3 - 10 cubic yard trucks  
1,200 gallon distributor  
Seal aggregate to be applied @ 0.27 cu. ft. per sq. yd.  
Asphalt cement to be applied @ 0.30 gal. per sq. yd.  
Temperature of A.C. 350°F  
Width of Application - 24 ft. or 2.67 sq. yd. per linear foot  
 $3 \times 10 \times 27 / 0.27 = 3,000$  sq. yd. aggregate available  
 $3,000 \div 2.67 = 1,124$  ft. shot with aggregate controlling  
 $1,124 \times 2.67 \times 0.30 = 900$  gal. A.C. @ 60°F  
 $900 \div 0.904 =$  approximately 1,000 gal. @ 350°F  
OK to make 1,124 ft. shot

<b>OFFICE OF STATE AID ROAD CONSTRUCTION</b>			S.O.P. NO. SA II-1-91
<b>STANDARD OPERATING PROCEDURES</b>			Page 4 of 4
Subject: S.O.P. SEAL COATS AND BITUMINOUS SURFACE TREATMENTS			Distribution A, B, C, D, E
EFFECTIVE  July 1, 2005	ISSUED  July 1, 2005	SUPERSEDES Page 4 of 4  S.O.P. NO. SA II-1-91  EFFECTIVE: April 15, 2000	APPROVED  J. Brooks Miller, Sr.  STATE AID ENGINEER

- 6.4. Application of Cover Aggregate: The application of the cover aggregate should be scheduled so that the time lapse before the bituminous material is covered will be the absolute minimum. Care should be exercised in the spreading of the aggregate so that it is spread to a depth of approximately one particle thickness. Since excess aggregate will not adhere to the bituminous material, the rate of application should be carefully evaluated. The desired uniform rate of application can be obtained by using an aggregate spreader. If the spreader has been properly adjusted and if it is operated at constant speed, seldom should there be a reason for spreading any cover aggregate by hand.
- 6.5. Rolling: The rolling operation should immediately follow the application of the aggregate material in order to embed the particles while the bituminous material is still soft and tacky. The operation should begin at the outside edge of the surface and progress toward the center. Rolling should be discontinued when the bituminous material has set or hardened.
- 6.6. Excess Cover Aggregate: When placing seal coats and surface treatments in half widths, the loose aggregate should be removed from along the longitudinal joint before the adjacent lane is surfaced.

7. RECORDS:

Field records should be kept and recorded on Form SA-724 in accordance with S.O.P. No. SA II-1-92.