

PART 1 GENERAL

32.1.01 DESCRIPTION

- A. This Specification includes work for applying a single application of asphalt material on a prepared asphalt surface, followed by spreading seal coat aggregate meeting these Specifications.

32.1.02 REFERENCE SPECIFICATIONS

- A. References made to the North Dakota Department of Transportation's Standard Specifications for Road and Bridge Construction designations shall be the latest revision at the time of call for bids.
- B. The current publications listed below form a part of this Specification.
- C. Standards
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| AASHTO T49 | Standard Method of Test for Penetration of Bituminous Materials |
| AASHTO T51 | Standard Method of Test for Ductility of Asphalt Materials |
| AASHTO T59 | Standard Method of Test for Emulsified Asphalts |
| AASHTO T96 | Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine |
| AASHTO T113 | Standard Method of Test for Lightweight Pieces in Aggregate |
| AASHTO T240 | Standard Method of Test for Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test) |
| AASHTO T301 | Standard Method of Test for Elastic Recovery Test of Asphalt Materials by Means of a Ductilometer |
| ASTM D5 | Standard Test Method for Penetration of Bituminous Materials |
| ASTM D92 | Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester |
| ASTM D244 | Standard Test Methods and Practices for Emulsified Asphalts |
| ASTM D2007 | Standard Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method |
| ASTM D2170 | Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens) |
| ASTM D2872 | Standard Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test) |
| ASTM D5801 | Standard Test Method for Toughness and Tenacity of Asphalt Materials |
| ASTM E70 | Standard Test Method for pH of Aqueous Solutions with the Glass Electrode |

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. The following items of Related Work are specified, and included in other sections of these Specifications.

SECTION 01 11 00	SUMMARY OF WORK
SECTION 01 22 19	MEASUREMENT AND PAYMENT
SECTION 01 33 00	SUBMITTAL PROCEDURES
SECTION 32 05 00	COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

32.1.04 SUBMITTALS

- A. The Contractor shall submit emulsion sealer product data, laboratory test results, and certification to the Engineer as described herein and in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.
- B. The Contractor shall submit aggregate gradation and test results to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications
- C. A detailed public notification plan shall be prepared and submitted including detailed staged notification to all public affected by the chip seal.
- D. The Contractor shall submit a traffic control plan for the project to the Engineer for approval. The traffic control plan shall indicate how soon after chip seal operations, the street will be re-opened to traffic.

PART 2 PRODUCTS

32.2.01 BITUMINOUS MATERIAL

- A. The bituminous material for seal coats shall be CRS2P emulsified asphalt, unless otherwise specified and approved.
- B. The bituminous material shall be accepted by certification conforming to the requirements of NDDOT Specification Section 818.
- C. Sampling and testing shall conform to the requirements of NDDOT Specification Section 420 and NDDOT Field Sampling and Testing Manual Section 420.02.
- D. Bituminous material for fog seal shall be SS-1H or CSS-1H, unless otherwise specified and approved.

32.2.02 AGGREGATE

- A. Aggregate for seal coat shall be CL 41-M, unless otherwise specified and approved conforming to the requirements of NDDOT Specification Section 816 as shown below.
- B. Sampling and testing shall conform to the requirements of NDDOT Specification Section 420 and NDDOT Field Sampling and Testing Manual Section 420.02.
- C. Furnish material consisting of crushed stone or crushed aggregate that is clean, durable fragments free from an excess of flat, elongated, soft or disintegrated pieces, clay balls or other deleterious material. Assure the material produced is free from adherent films of clay or rock dust and is washed thoroughly.

Sieve Size or Testing Method	ND/DOT Aggregate Class					
	41	41M	42	43	44	45
	Percent Passing or Testing Requirement					
5/8 inch					100	
3/8 inch	100					100
No. 4	20-70					85-100
No.8	0-17		2-20	0-17		
No.16						45-80
No. 50						10-30
No. 200	0-1.5		0-5	0-2	0-20	0-3
ND T113, Shale (max %)	8.0%					3.0%
AASHTO T96, LA Abrasion (max %)	40%					
NDDOT 4, Fractured Faces ¹		50%				

¹ Minimum weight percentage allowable for the portion of the aggregate retained on a No. 4 sieve having at least 1 fractured face for Class 41M.

PART 3 EXECUTION

32.3.01 GENERAL

- A. The work shall be done in the following order: Preparing the pavement surface; applying the emulsion sealer; applying aggregate; rolling the aggregate; brooming the aggregate with a secondary broom when specified; and sweeping up and disposing of excess aggregate off the job site.

32.3.02 PREPARATION

- A. Prior to the Chip Seal operation, the Contractor shall remove all vegetation within the limits of the chip seal by applying an approved herbicide.
- B. The herbicide shall be applied at least 10 days prior to the chip seal operation, or as directed by the manufacturer of the approved herbicide. All herbicides shall be certified for use in the state in which the work is to be performed. The application of the herbicide shall be performed in accordance with applicable regulations. All fines or clean-up costs for unlawful misuse or discarding of herbicides shall be the sole responsibility of the Contractor. Mixtures and spread rates for the herbicides shall be determined by the manufacturer's specifications. Wash down of equipment or discarding of herbicides shall not enter the catch basins or positive drainage facilities.
- C. At least 48 hours prior to the beginning of chip seal operations, the Contractor shall notify all affected property owners, residents, businesses, and agencies by an approved, written notice detailing streets and limits of work to be done and the hours of work.
- D. At least 48 hours prior to the beginning of chip seal operations, the Contractor shall post Engineer approved "No Parking" signs on all streets to be chip sealed.
- E. Prior to the Chip Seal operation, all personnel covers, drain inlet covers, monument covers, and all other utility covers shall be protected from the Contractor's chip seal operations by adhering a sheet of paper or plastic cut to fit, placing a plastic bag over the exposed facilities, or other methods approved by the Engineer. All traces of plastic, adhesive material, residual emulsion, and chips shall be removed from all personnel covers, drain inlet covers, monument, covers, and all other utility covers as quickly as possible after the application of the chip seal and prior to final acceptance of the project. The Contractor shall replace or clean at Contractor's expense, any damaged or oil-stained items within the construction limits.
- F. Immediately prior to the chip sealing operations, the Contractor shall sweep the entire surface with kick brooms on county and state highways, and with a vacuum or pickup sweeper on city streets. Areas that have been patched shall receive a fog seal at the discretion of the Engineer.
- G. There shall be no standing water on streets to be chip sealed.

32.3.03 SEASONAL LIMITATIONS

- A. Seal coating operations cannot be performed before May 15th or after September 1st.

32.3.04 WEATHER LIMITATIONS

- A. Do not apply asphalt material when the street face is damp or wet, or when the pavement temperature in the is less than 60° F. Do not start work without the Engineer's approval and terminate work at once in event of rain. Terminate seal coating work just before dark, and stop work during wind that blows sand, dust or other foreign matter into the spread asphalt material before the aggregate is applied.

32.3.05 PREPARATION

- A. General
 - 1. Do not start coat operations until, the Engineer determines the asphalt surface course to be seal coated is thoroughly compacted and rolling and all holes and breaks in the surface and edges are repaired. In no event, unless ordered in writing by the Engineer, is the seal coat to be placed on newly constructed or reconditioned surfaces within 7 days of the surface having been placed.
- B. Cleaning
 - 1. Immediately before applying the asphalt material, clean the surface of all dust, dirt, sand or other objectionable material that prevents complete coverage or bond between the asphalt material and the street surface, using a rotary power broom or blower, by hand sweeping, or both, as required. Thoroughly clean the outer edges adjacent to vertical curbs. Do not mix material removed from the surface with the cover aggregate.
- C. Technical Provisions

1. None

32.3.06 APPLICATION OF ASPHALT MATERIAL

- A. The areas to be chip sealed shall have the emulsion sealer applied with a distributor truck to the pavement surface at a rate of 0.35 to 0.50 gallons per square yard. The actual emulsion sealer application rate required will be determined by the pavement surface condition and the aggregate used. Recommended emulsion sealer application rate is 0.41 gallons per square yard. The actual application rate of the emulsion sealer shall be determined by the manufacturer's representative as approved by the Engineer.
- B. The Engineer may require adjustments in the application during the work. When heating is required, take precautions to avoid fire hazard. Thoroughly clean the distributor before use unless its last use was with the same type of asphaltic material specified for the work.
- C. Use contractor building paper as a launching pad at all starts and stops. Before application, spread building paper over the surface, from the joint back, for the distance required for the spray bar to begin spraying and operating at full force when it reaches the surface to be treated. After the asphalt is applied, remove and dispose of the building paper.
- D. Shut off the spray bar instantly at each construction joint to assure a straight line and the full application of asphaltic binder up to the joint. If required to prevent dripping, insert a drip pan under the nozzles when the application is stopped.
- E. Use a hand sprayer to apply asphaltic binder to touch up all spots missed by the distributor.
- F. Before and during seal coating operations, calibrate or check the adjustments on the distributor as follows:
 1. Tank calibration
 2. Nozzle adjustment and pressure
 3. Spray bar height
 4. Bitumeter calibration
 5. Transverse and Longitudinal Spread of Asphalt Material.
 - a. Longitudinal spread variation shall not exceed 10 percent plus or minus of the rate specified.)

32.3.07 APPLICATION OF SEAL COAT MATERIAL

- A. Immediately following the application of the emulsion sealer, aggregate shall be applied with a spreader at a range between 20 to 40 pounds per square yard. Recommended aggregate cover coat application rate is 25 pounds per square yard. During the course of the work, adjustments will be made in the rate of application when required.
- B. Assure the cover coat material is stockpiled enough in advance of the work so that excess water has drained from the aggregate. Do not spread seal coat aggregate if the moisture content of the aggregate exceeds 4 percent.
- C. Uniformly distribute the cover coat at the specified rate using a mechanical or a self-propelled spreader immediately after the asphaltic material application. If weather or surface conditions require, restrict the application of asphalt material to the area coverable by the cover coat material available in the trucks. Assure cover aggregate is available at all times to assure continuous seal coating operations. Do not apply seal coat aggregate to cold, dried or partially dried asphalt material.
- D. Immediately after spreading, roll the aggregate with self-propelled, pneumatic-tired rollers. Roll in a longitudinal direction, beginning at the outer edges of the treatment and working toward the center. Overlap the previous strip by about one-half the roller width. Complete the first rolling of the aggregate within one-half hour of it being spread. Continue rolling until a smooth, thoroughly compacted surface is obtained. Roll at least three complete passes with each roller. If the seal coat is finished in partial widths at a time, leave 4 to 6 - inches of the inside edge uncovered with aggregate to permit overlap of asphaltic material when the remaining portion of the surface is treated.

- E. Remove all loose aggregate from the pavement after the work is completed, and dispose of at the specified location. If a location is not designated the chips become the Contractor's property.

32.3.08 ROLLING

- A. A minimum of three self-propelled pneumatic-tired rollers shall be used for the required rolling of the aggregate. The pneumatic-tired rollers shall be in good working condition and actively rolling at all times during the chip seal operation. The pneumatic-tired rollers shall be a minimum 5 tons. The pneumatic-tired rollers shall be operated in such a manner to prevent the dislodging of newly applied aggregate.
- B. Rollers shall proceed at a maximum speed of five (5) mph. The entire surface shall receive a minimum of four (4) roller passes. The first roller pass shall be performed within two (2) minute of aggregate spreading.

32.3.09 CLEANUP

- A. Power sweeping shall be done before the end of the day after chip seal operation once materials have completely cooled to the manufacturer's recommended temperatures to remove any excess loose aggregate. During the sweeping process, the Contractor shall use a backpack blower or other capable equipment to clear driveways, gutters and sidewalks of excess aggregate at the end of each day until the street is micro surfaced.
- B. The Contractor shall exercise care to prevent oil from being deposited on concrete surfaces. Each day the Contractor shall remove oil from the surfaces not designated to be chip sealed or capped. No additional streets shall be chip sealed until this cleanup has been performed. The method of the oil removal shall be approved by the Engineer.
- C. The application of blotter material shall be in the amount and manner approved by the Engineer to correct "bleeding". Blotter material shall be considered incidental to the price bid for seal aggregate, unless otherwise specified.
- D. The Contractor shall install temporary raised pavement markers once the chip seal is cured until the roadway surface is ready for permanent pavement markings.

32.3.10 MAINTENANCE

- A. The seal coat shall be maintained by the Contractor in a satisfactory manner and condition for five (5) days. Maintenance of seal coat may require redistribution of loose aggregate, application of additional aggregate and bitumen, additional rolling and application of blotter material, and sweeping.
- B. Perform a final sweeping at the end of the maintenance period. Remove excess material from roadway and shoulders.

32.3.11 BITUMINOUS FOG SEAL

- A. A fog seal shall be applied to the entire roadway including sloughs, if present, after the chip seal is applied. The Contractor shall broom the roadway prior to fog seal application.
- B. Bituminous fog seal shall be constructed in conformance with the requirements of NDDOT Specifications Section 401.
- C. The fog seal shall be diluted at 50 percent and done by the supplier.

32.3.12 PROTECTION OF STREET SIDE STRUCTURES AND TRAFFIC CONTROL

- A. Protect all sign posts, street lamp posts, trees, shrubs and tops of curbs and gutters from splashing asphaltic material. Compensation for furnishing, erecting and removing such protection is included in the unit price bid for the application of asphalt material.
- B. Keep traffic off of freshly sprayed asphalt.

END OF SECTION

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