CITY OF FARGO SPECIFICATIONS
SEAL COATS

PART 1
DESCRIPTION OF WORK

The work to be done under this section of the Specifications and the accompanying plans consists of furnishing all labor, material, accessories, and plant necessary to complete the improvement of designated streets, avenues, or alleys in the City of Fargo.

This item shall include the cleaning, drying, and preparing the existing pavement and the application of the seal bitumen, seal aggregate, rolling, and other operations necessary to properly complete the seal coat.

All seal coat design and application shall be per the "Minnesota Seal Coat Handbook", 2006 version.

PART 2
MATERIALS

2.1. MATERIAL

All material shall be obtained from approved sources and shall conform to the latest applicable ASTM standards.

2.1.1. SEAL BITUMEN

Seal bitumen shall be polymer-modified cationic emulsified asphalt: CRS-2P, and shall be produced by using polymer-modified base asphalt only. The use of latex modification will not be allowed. The particular seal bitumen used for the seal coat shall be subject to the approval of the Engineer. The Contractor shall provide the Engineer with a sample from each tanker. Each sample shall be in a clean, sealed plastic container.

The emulsion shall be protected from freezing and from separating and breaking. Any emulsion that has been frozen or has separated and broken will be rejected and removed from the site at the Contractor's expense.

2.1.2. SEAL AGGREGATE

Seal aggregate shall be free of dirt, strippings, and organic matter, and shall be sufficiently moistened with water so that it is in the saturated surface dry condition when applied. The seal aggregate shall be a Minnesota Class A aggregate conforming to a Minnesota FA-2 gradation and quality.

2.1.3. SEAL AGGREGATE #2

Seal aggregate #2 shall be free of dirt, strippings, and organic matter, and shall be sufficiently moistened with water so that it is in the saturated surface dry condition when applied. The seal aggregate #2 shall be a Minnesota Class A aggregate conforming to a Minnesota FA-3 gradation and quality.

2.1.4. ASPHALT WEARING COURSE

Per Section 2400 of these Specifications.

2.1.5. DESIGN AND SUBMITTALS

The Contractor shall perform a design as outlined in the Minnesota Seal Coat Handbook and provide the following information to the Engineer for review and approval two weeks before construction is planned to begin:

1) Test results on aggregate gradation.
2) Seal aggregate design application rate for each aggregate size.
3) Seal oil design application rate.
4) Loose unit weight of each aggregate size.
5) Bulk specific gravity of each aggregate size.

Note: The seal aggregate design application rate is the minimum application rate based on the design program. Any additional material needed, as determined by the Engineer in the field, shall be considered incidental to the respective seal aggregate bid item.

2.2. EQUIPMENT

All equipment shall be kept in satisfactory repair at all times and shall meet the approval of the Engineer.

2.2.1. BROOMS

All brooms shall be motorized with a positive means of controlling vertical pressure and capable of cleaning the streets prior to spraying bituminous material and also removing loose aggregate after seal coating. Each broom shall be constructed so that the revolutions may be adjusted to its progression.

2.2.2. ASPHALT DISTRIBUTOR

The distributor shall be capable of uniformly distributing the bituminous material at the desired rate. It shall be equipped with a pressure pump and gauges capable of maintaining uniform and adequate pressure throughout the length of the spray-bar. The distributor shall have a system to evenly heat and circulate the material and be equipped with a thermometer to accurately measure the temperature. It shall be equipped with

adjustable full circulation spray-bars with cut off valves or other means of starting and stopping the flow of bitumen quickly and uniformly over the length of the spray-bar. The Contractor shall make available data showing the manufacturer's recommendation for spray bar height above the surface, nozzle size, and the angle of the spray fan with the spray bar axis. Nozzles shall be clean and at the correct angle.

The truck shall be equipped with a tachometer, operated by a wheel independent of the truck wheels, to accurately measure the truck speed in feet per minute. A bitumeter and tachometer chart shall be kept in the truck at all times. These charts shall be readily available to the Engineer at any time during the job to check the application rates of the bituminous material. The distributor shall be equipped with a digital application rate indicator that indicates the application rate in square yards as the truck is applying the bitumen.

2.2.3. SCALES

The scales shall be of the platform type sensitive to a weight of twenty pounds and shall have the capacity to weigh the maximum load. The scales shall be approved and calibrated by the state in which it is located and proof of such calibration furnished to the Engineer upon his request.

2.2.4. PNEUMATIC TIRED ROLLERS

Rollers shall be equipped with a minimum of six wheels in front and seven wheels in the rear. Each wheel shall be mounted on an oscillating axle and the rear wheels shall be staggered with the front wheels. They shall be constructed so that they can be loaded to a gross weight of at least two hundred and twenty-five (225) pounds per inch of tread width.

2.2.5. AGGREGATE SPREADER

The mechanical spreader shall be capable of placing the designated amount of aggregate in a smooth, uniform layer on the seal bitumen. The spreader shall be designed so the wheels do not contact the seal bitumen before it is covered with the aggregate. The application rate of the spreader shall be adequate to cover the width of one traffic lane plus one foot minimum. The spinner broadcast type of aggregate spreader will not be allowed. Prior to the application of the aggregate, the Contractor shall verify with the Engineer that the machine has been calibrated to evenly distribute the designated amount of aggregate.

Calibration and testing shall be done in accordance with the latest revision of ASTM D-5624. The spreader shall be adjusted to provide uniform coverage across the entire width of the spreader, plus or minus one pound per square yard. If the spreader is not calibrated, the project will be suspended until calibration has been completed.

PART 3
CONSTRUCTION

3.1. PREPARATION OF THE EXISTING PAVEMENT

All loose, pocketed, caked, or other deleterious material shall be removed from the existing pavement. Flushing or sweeping with hand or power brooms will be acceptable methods of cleaning the pavement and shall be done daily prior to the application of the seal bitumen.

When directed by the Engineer, asphalt wearing course shall be used to level depressed joints and depressions. The leveling process shall be done a minimum of 2 weeks prior to the chip seal installation. Wear course leveling shall be according to Section 2400 of these Specifications.

All costs associated with installing the leveling course shall be included in the bid item for "Asphalt Wearing Course".

3.2. TEST STRIPS

The Contractor shall spray and apply chips to a test strip of approximately 50 feet to be certain the chips are being properly embedded in the oil. This process will be repeated as necessary until the proper application rate is verified.

Note: Application rates may vary according to specific design for the particular aggregate used.

The Contractor shall submit an aggregate sample to a local testing company to determine the appropriate aggregate and oil application rate for bidding purposes.

The Contractor shall make certain the distributor and aggregate spreader are in good working order and calibrated to apply the materials at the specified rates. If the Contractor fails to calibrate the equipment prior to the start of the project, the project will be shut down until the Contractor can verify that the equipment is properly calibrated and prove to the Engineer that the design application rates are being obtained.

3.3. APPLICATION OF THE SEAL BITUMEN

Prior to applying the seal bitumen, all manhole castings and gate valves, including any concrete surrounding them, shall be covered with paper, sand, or other effective means to prevent the seal bitumen from coming into contact with them. The application of the seal bitumen shall not begin until the aggregate and aggregate spreader and rollers are standing by and ready to follow immediately.

The application rate of the bitumen shall be based on the design, adjusted by the Engineer for varying pavement surface conditions. The application rate may be varied by the Engineer at any time during the work to adjust to conditions.

The spraying temperature shall be within the following limits at the time of application:

Temperature = 110 to 160° F, or 40 to 70° C

The seal bitumen shall only be applied when the pavement and air temperature is at least 60° F (15.5°C) and rising.

The Contractor shall use appropriate procedures to make certain oil spray does not overlap at longitudinal or transverse edges when continuing on from a previous application.

3.4. APPLICATION OF THE SEAL AGGREGATE

The application of the seal aggregate shall begin immediately behind the asphalt distributor. **Seal bitumen shall be covered with the aggregate in less than one minute and the aggregate shall be initial-rolled within 2 minutes of being spread.** The aggregate shall be applied with the spreader and shall be in the saturated surface dry condition at the time of application.

Any areas in which aggregate is not placed within 90 seconds of the oil being shot will be rejected and no payment will be made for the rejected area.

The application rate of the aggregate shall be based on the design, adjusted by the Engineer for varying pavement surface conditions. The application rate may be varied by the Engineer at any time during the work to adjust to conditions.

Areas inaccessible to mechanical equipment shall be sealed by hand equipment in an approved manner. The Contractor shall remove any excessive deposits of aggregate that may result in a rough ride.

3.5. ROLLING THE SEAL COAT

Rolling shall be commenced as soon as the aggregate has been spread, with initial rolling completed within 2 minutes of being spread. A minimum of three pneumatic tired rollers shall be used to embed the aggregate. Rolling shall be done in straight, parallel, overlapping strips as quickly as possible before the asphalt emulsion breaks. Travel speed of the roller should not exceed 5 mph so that the chips are properly embedded. As soon as rolling has been completed the street may be opened to traffic.

3.6. PAVEMENT MARKINGS AND TEMPORARY TABS

Refer to Section 4000 of these Specifications for pavement marking and temporary tab requirements for seal coat projects.

3.7. TRAFFIC CONTROL

The Contractor shall conduct his work in such a manner as to interfere as little as possible with the use of the streets for public travel. When streets or public thoroughfares are impacted by construction activity, the public shall be protected by placement of adequate warning devices. All barricades and obstructions shall be illuminated by means of amber lights or reflective sheeting for nighttime hours. All traffic control devices shall be constructed, maintained, and located in accordance with the current version of the "Manual of Uniform Traffic Control Devices" as set forth by the U. S. Department of Transportation and the Federal Highway Administration. "Fresh Oil, Loose Rock" signs shall be placed at all ends of the project and temporary "No Parking" signs shall be furnished, installed, and removed by the Contractor at no additional cost to the City.

3.8. SWEEPING OF THE EXCESS AGGREGATE

The Contractor shall sweep the streets within 48 hours of placing the seal aggregate on the street. All costs for sweeping shall be included in the price bid for seal aggregate. The Contractor shall promptly repair any defects uncovered during the sweeping process. All sweepings shall become the property of the Contractor to be disposed of at his discretion. Should the Contractor request it,

the City will provide a dump site located within the Fargo city limits for disposal of the sweepings.

PART 4
GUARANTEE, MEASUREMENT & PAYMENT

4.1. GUARANTEE

The guarantee shall be per the contract.

4.2. MEASUREMENT AND PAYMENT

4.2.1. SEAL BITUMEN (SEAL OIL)

Payment for seal oil shall be by the gallon, calculated using the square yardage times the application rate, or the sum of the gallons shown on the tanker manifests, whichever is less.

4.2.2. SEAL AGGREGATE

Payment for seal aggregate shall be by the square yard, calculated by the Engineer using digital area calculation methods available in CAD software.

4.2.3. ASPHALT WEARING COURSE

Payment for asphalt wearing course shall be by the ton including 5 ½ to 6% asphalt cement.

4.2.4. PRICE REDUCTIONS

In addition to the price reductions for failing gradations outlined in the MN Seal Coat Handbook, the following deductions for the Flakiness Index shall be applied by change order:

Flakiness Index	Deduction
0-25	None
25.01 – 30	1¢ per SY plus $1,000 per add'l failing test
30.01 – 35	2¢ per SY plus $1,000 per add'l failing test
35.01 – 45	4¢ per SY plus $1,000 per add'l failing test
Over 45*	Provide new seal aggregate plus $1,000 per add'l failing test

* New seal aggregate supplied will be subject to the same material, gradation, and flakiness requirements and deductions as the orifinally supplied seal aggregate.

4.2.5. TRAFFIC CONTROL

Traffic control shall be paid on a lump-sum basis per section of the project, and shall include all costs to control parking and protect the travelling public as outlined in this specification.

4.2.6. OTHER COSTS

All other costs for work necessary to properly complete the work specified herein shall not be bid items; the costs shall be charged to other items unless a bid item is specifically included on the bid sheet.