SPECIFICATIONS FOR DOUBLE CHIP SEAL

1.0 DEFINITIONS

The term Director [Superintendent, etc.] shall mean the Director of Public Works of the awarding authority.

The term Designee shall mean an employee of the awarding authority, designated by the Director.

The term Contractor shall mean a professional company contracted by the awarding authority to perform work under this agreement.

2.0 DESCRIPTION

Work under this contract shall consist of the Contractor furnishing and applying liquid asphalt and cover aggregate seal on properly prepared bituminous streets. Bid quantities are approximate only; payment shall be for actual quantities applied to streets. Streets to be stone sealed shall be selected by the Contractor and the Director or his/her Designee.

3.0 MATERIALS

3.1 Liquid Asphalt:

Liquid asphalt grades shall be: CRS-2L, CRS-2P, RS-2L (2% Latex), or MC-3000 conforming to AASHTO specifications M316, M140 or M82.

3.2 Latex Additive:

The latex additive shall be Butonal NX 1129 (Anionic) or Butonal NX 4190 (Cationic) or equivalent conforming to the following specifications. It is required that the latex be co-milled at the bulk emulsion facility, to ensure complete and balanced blending. The emulsion manufacturing plant must be open to inspection by the awarding authority.

	Anionic	**Cationic**
Monomer Rato (Butadiene/Styrene)	(76 +/- 2/24 +/- 2)	(76 +/- 2/24 +/- 2)
Solids, min %	67	63
Solids, min lbs./gal.	5.2	4.8
Coagulum (80 mesh screen max)	0.1%	0.1%
pH of Latex	10.0 – 10.7	5.0 – 5.6
Brookfield Visc (Model RVT, #3 spindle @20 RPM)	1000 – 2000	250 - 2000
Mechanical Stability	Excellent	Excellent

3.3 Cover Aggregate:

Cover Aggregate shall be crushed stone, free from dust, soft stone or other contaminants, with a minimum of 90% of the stones have a fractured face. All stone shall satisfy a 35% maximum for the L.A. Abrasion Test and a 35% maximum for the Flakiness Index Test. Aggregate shall meet the following gradation as tested by AASHTO T27.

1/2" (12.5 mm) Stone		**3/8" (9.5 mm) Stone**	
Sieve Size	**% Passing**	**Sieve Size**	**% Passing**
5/8" (15.8 mm)	100	1/2" (12.5 mm)	100
1/2" (12.5 mm)	90 – 100	3/8" (9.5 mm)	85 – 100
3/8" (9.5 mm)	15 – 65	#4 (4.75 mm)	0 – 30
#4 (4.75 mm)	0 – 8	#8 (2.36 mm)	0 – 6
#8 (2.36 mm)	0 – 4	#200 (0.075 mm)	0 – 2*
#200 (0.075 mm)	0 – 2*		

*Pre-treatment of the stone is required if the percentage passing of 0.075 mm (#200) is greater than 1.0%. Proper pre-treatment shall be obtained by a twin shafted Pugmill with a Digital Readout Belt Scale. The stone shall be treated with a diluted slow setting emulsion at the rate of 1 – 2 gallons per ton to ensure uniform treatment of all aggregate.

4.0 MATERIAL QUANTITIES

The total quantity of asphalt emulsion to be used on the double application shall be in the range of 0.70 to 0.90 gallons per square yard, or the quantity of MC-3000 to be used on the double application shall be in the range of 0.55 to 0.75 gallons per square yard. Cover aggregate shall be spread in the range of 55 to 75 pounds per square yard. The Contractor will use lab tests to design specific material quantities to meet existing field conditions. Variations in material quantities will be made without adjustment to contract unit price. The Contractor must maintain a laboratory open to the inspection of the awarding agency.

5.0 EQUIPMENT

The equipment used by the Contractor shall include, but not be limited to, one or more of the following:

5.1 Asphalt Distributor:

The asphalt distributor shall contain suitable mechanical circulating and heating mechanisms to provide a uniform approved temperature of the entire mass of material. The distributor shall be equipped with a radar type sensor used to measure ground speed, and feed a Digital Volumetric Accumulator capable of measuring liters applied and distance traveled. It shall be capable of applying asphalt material in accurately measured quantities at any rate between 0.1 to 2.0 gallons per square yard, of roadway surface, at any length of spray bar up to 16 feet. The distributor shall be capable of maintaining a uniform rate of distribution of asphalt material regardless of change in grade, width or direction of the road. It shall be equipped with an

electronic control for setting asphalt pump discharge rate and on/off switching of spray for nozzles in one (1) foot, increments which shall be located in the truck cab. The spray nozzles and pressure system shall provide a sufficient and uniform fan-shaped spray of asphalt material throughout the entire length of the spray bar at all times while operating. The spray shall completely cover the roadway surface receiving the treatment.

5.2 Aggregate Spreader:

The aggregate spreader shall be hydrostatically driven and self-propelled. It shall be equipped with a hydraulically controlled variable adjustable head that is capable of spreading stone in widths from 4.5 to 18 feet. The spreader shall be mounted on pneumatic tires and shall apply the treated stone on the road surface in a manner that ensures that the tires do not contact the road surface until after the stone has been applied. The unit shall be equipped with an electronic radar type sensor used to measure ground speed and will automatically adjust the stone application rate depending on width of application and the speed of chip spreader. It shall have the ability to apply stone on any grade from 0 - 6%. The spreader shall be equipped with an integral hopper with a minimum capacity of 5 tons, of treated stone which shall be filled by trucks in a manner which ensures that the truck tires never come in contact with asphalt-treated road surfaces until the stone has been properly applied. To maintain constant stone application, a self-locking truck hitch will permit towing of aggregate trucks without stopping the chip spreader. It will capable of maintaining positive engagement over irregular terrain.

5.3 Rollers:

A minimum of two (2) rollers, with at least one (1) pneumatic tire roller, shall be used on each treated surface immediately after the stone has been applied. Each roller shall have a compacting width of not less than 5 feet and a gross weight of not less than 7 tons.

5.4 Trucks:

Rear discharge conveyor-fed trucks in sufficient number and size must be used to deliver aggregate to the spreader.

6.0 CONSTRUCTION PROCEDURES

6.1 Streets to be Treated:

The Contractor and the Director shall mutually determine the streets which shall receive double chip seal treatment. Measurements of streets to be treated shall be made by the Contractor and the Director or his/her Designee, and the Contractor shall prepare a cost estimate for each street prior to beginning work.

6.2 Staging Location

The awarding authority shall provide a staging area for equipment and materials to be used on the project. The Contractor and Director shall mutually review and agree that the location is of adequate size and condition to allow for safe and secure usage for the required operation(s).

The awarding authority shall provide a location for disposal of asphalt/aggregate debris created in the adjustment of utility castings/structures, milling of keyways, and any pre- or post- project sweeping.

6.3 Surface Preparation:

All surface preparations shall be completed by the awarding authority prior to applying the surface treatment unless otherwise noted or bid as separate items.

The awarding authority shall be responsible for removal of all thermoplastic traffic markings, cleaning and flush filling all cracks and joints greater than 1/4" wide. The awarding authority shall place a leveling course on planed, milled or existing surface, if required.

The contractor shall cover all manhole covers, water boxes, gas boxes, catch basins and other such utility structures with plastic or building felt. Reference each for location and uncovering after application.

The contractor shall thoroughly clean the surface by sweeping immediately prior to application of the emulsion. Prior to sweeping, the awarding authority shall have removed all vegetation and soil that is bound to the roadway surface.

6.4 Weather Limitations:

No work shall be completed during rainy conditions. The ambient temperature must be 50°F and rising.

6.5 Asphalt and Aggregate Application:

The liquid asphalt and aggregate shall be applied at the material quantities as designated in Section 4. The liquid asphalt shall not be applied more than 300 feet in advance of the self-propelled aggregate spreader.

6.6 Rolling:

Initial rolling shall be done immediately following the application of aggregate. A minimum of three (3) passes should be completed over the entire treated area. Rollers shall be operated at a speed that will not displace aggregate.

6.7 Traffic Control:

Traffic control is the sole responsibility of the awarding authority. Unless otherwise specified, the roadway shall be kept open to traffic at all times, with traffic discontinued on the lane being surface treated. Controlled traffic may be permitted as soon as the final layer is applied and rolled. A recommended maximum speed of 20 mph, should be maintained for a period of two (2) hours.

6.8 Surplus Aggregate:

Surplus aggregate shall be swept off of the road surfaces by the awarding authority. Sweeping shall be done after chip seal has properly cured, and care will be taken not to dislodge imbedded aggregate or damage the surface.

7.0 PERFORMANCE

The awarding authority will not award this contract unless the Contractor furnished satisfactory evidence of his/her ability and experience to perform this work, and that he/she has sufficient capital and equipment to enable him/her to prosecute the work successfully and to complete it

within the time named in the contract. The Contractor shall not sublet any portion of this contract, and will own all equipment used to complete such contract. As part of the bid, the Contractor must submit a list of six similar and successfully completed jobs on which they have been the prime contractor, whose relevance to the proposed job shall be deemed by the awarding authority. The name, address, and telephone number of a contact person involved with each of these projects must be included so they can be investigated prior to the award of the contract. It will be the responsibility of each bidder to visit the job site with the Director. The awarding authority can reject any bid of a contractor who has not visited the work site.

8.0 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for work under this agreement shall be made at the contract unit price per square yard times the number of square yards, measured by the Contractor and the Director or his/her designee, of road surface treated. Price per square yard shall be for complete in place quantities. Upon completion of work, and acceptance by the Director, the Contractor shall submit a payment request to the Director. Payment shall be net thirty (30) days.

9.0 GUARANTEE

Any material or workmanship found to be defective for up to one (1) year from the date of acceptance by the Director shall be replaced by the Contractor at no cost to the awarding authority. Upon notification of defective material or workmanship, the Contractor shall immediately replace such defective areas.

PRICE ADJUSTMENT

A fluctuating price will be required for this bid to allow for price adjustments based on the period price of asphalt cement in the awarding authority's state. The price adjustment will be based on the variance in price for the asphalt cement component only from the Base Price to the Period Price. Base price for this bid will be $_____ per ton of asphalt cement.

"Base Price" = the price of PG binder liquid per ton that exists on the bid opening date, listed above.

"Period Price" = the price of PG binder liquid per ton on the date the stabilization work is performed.

Double Chip Seal:

Current Price minus Base Price divide by 238 (Gal. in ton emulsion) x .66 (asphalt in Gal. emulsion) x .80 Gal. / SY (application rate) =Adjustment per square yard.

BID FORM

<u>BASE BID:</u> DOUBLE CHIP SEAL applied to town prepared roadways in accordance with the attached specifications.

Price per Square Yard $ _____

Bidder: _____ Phone: _____

Address: _____ Fax: _____

_____

Signature: _____

Printed Name & Title: _____

Date: _____

REFERENCE LIST FOR DOUBLE CHIP SEAL

Please list six similar projects that have been completed as the Prime Contractor:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount:

Owner:
Address:
City, State, Zip:
Contact:
Phone:
Contract Amount: