CITY OF WEST BEND, WISCONSIN

SECTION 600

ASPHALTIC CONCRETE CONSTRUCTION

Section Number	Title
601	GENERAL
602	DESCRIPTION OF ASPHALTIC CONCRETE MIXES
603	MATERIALS FOR ASPHALTIC CONCRETE
604	TRANSPORTATION OF MIXTURES
605	CONSTRUCTING ASPHALTIC CONCRETE PAVEMENTS
606	REPAIRS OF ASPHALTIC CONCRETE PAVEMENTS
607	SURFACE PREPARATION
608	ASPHALTIC CONCRETE OVERLAYS
609	SLURRY SEAL SURFACE TREATMENT
610	CHIP SEAL SURFACE TREATMENT (SEAL COAT)
611	CRACK SEALING OF ASPHALTIC CONCRETE PAVEMENTS
612	CAPE SEAL SURFACE TREATMENT

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SECTION 600 - ASPHALT CONCRETE CONSTRUCTION

TABLE OF CONTENTS

601 General
- 601.1 Scope
- 601.2 Standard Wisconsin DOT Specifications
- 601.3 Earthwork, Grading, and Graveling
- 601.4 Job Mix Design and Samples
- 601.5 City's Authorized Representative
- 601.6 Notices to the Public
- 601.7 Two-Phased Paving

602 Description Of Asphaltic Concrete Mixes
- 602.1 General
- 602.2 Residential Streets
- 602.3 Collector Streets
- 602.4 Arterial and Industrial Streets
- 602.5 Quality Control Program

603 Materials for Asphaltic Concrete
- 603.1 General
- 603.2 Nonconforming Mixes

604 Transportation of Mixtures

605 Constructing Asphaltic Concrete Pavements
- 605.1 Foundation for Flexible Base Course
- 605.2 Foundation for Asphaltic Concrete Surfacing
  - 605.2.1 Crushed Aggregate Base Courses
  - 605.2.2 Asphaltic Treated Surfaces and Pavements
  - 605.2.3 Concrete Pavements and Bases
  - 605.2.4 Uneven Pavements
- 605.3 Tack Coat
- 605.4 Placing Asphaltic Concrete Paving Mixtures
  - 605.4.1 Preparation
  - 605.4.2 Spreading
- 605.5 Compaction
  - 605.5.1 General
  - 605.5.2 Degree of Compaction
  - 605.5.3 Compaction Testing
    - 605.5.3.1 General
    - 605.3.3.2 Contractor Furnished Compaction Testing
- 605.6 Measurement and Payment

606 Repairs Of Asphaltic Concrete Pavements
- 606.1 Scope of Work
- 606.2 Full Depth Patches of Asphaltic Concrete Pavement
  - 606.2.1 General
  - 606.2.2 Saw Cutting
  - 606.2.3 Repair of Base and Subbase
  - 606.2.4 Temporary Surfaces of Patching Areas
  - 606.2.5 Tack Coat
  - 606.2.6 Placement Of Patches
  - 606.2.7 Compaction
  - 606.2.8 Measurement
  - 606.2.9 Payment

606.3 Partial Depth Patches of Asphalt Concrete Pavement
606.3.1 General
606.3.2 Measurement
606.3.3 Payment

606.4 Asphaltic Concrete Wedges
606.4.1 General
606.4.2 Surface Preparation
606.4.3 Tack Coat
606.4.4 Placement of the Wedging
606.4.5 Compaction
606.4.6 Manhole and Valve Box Adjustments
606.4.7 Measurement
606.4.8 Payment
606.5 Crack Sealing Before Resurfacing
606.5.1 General
606.5.2 Measurement and Payment
606.6 Milling
606.6.1 General
606.6.2 Measurement
606.6.3 Payment
606.7 Paving Fabric
606.7.1 General
606.7.2 Measurement and Payment

607 Surface Preparation for Resurfacing

608 Asphaltic Concrete Overlays
608.1 Scope of Work
608.2 General
608.3 Materials and Construction
608.4 Measurement and Payment

609 Slurry Seal Resurfacing
609.1 Scope Of Work
609.2 Applicable Specifications
609.2.1 Test Methods for Aggregate and Mineral Filler
609.2.2 Test Methods for Asphalt Emulsions
609.2.3 Test Methods for Asphaltic Slurry Surfaces
609.2.4 Specifications for Mineral Fillers
609.2.5 Specifications for Asphalt Emulsions
609.3 Description
609.4 Materials
609.4. 1 Asphalt Emulsion
609.4. 2 Aggregate
609.4. 3 Boiler Slag
609.4. 4 Water
609.4. 5 Additives
609.4. 6 Slurry Seal Mix Design
609.4. 7 Laboratory Testing
609.4. 8 Sampling
609.4. 9 Field Testing
609.4.10 Stockpiling of Aggregate
609.4.11 Storage

609.5 Equipment
609.5.1 Slurry Mixing Equipment
609.5.2 Slurry Spreading Equipment
609.5.3 Cleaning Equipment
609.5.4 Auxiliary Equipment
609.6 Surface Preparation
609.7 Notifications
609.8 Weather Restrictions
609.9 Application of The Slurry Surfaces
609.9.1 Fogging
609.9.2 Mixing
609.9.3 Spreading
609.9.4 Composition and Rate of Application of the Slurry Mix
609.9.5 Joints and Edges
609.9.6 Hand Work
609.9.7 Curing
609.9.8 Rolling
609.9.9 Manhole and Valve Box Covers
609.10 Measurement
609.11 Payment

610 Chip Seal Surface Treatment (Seal Coat)
610.1 Scope of Work
610.2 General
610.3 Materials
610.3.1 Asphaltic Materials
610.3.2 Cover Aggregate
610.4 Surface Preparation
610.5 Construction
610.5.1 Weather Restrictions
610.5.2 Spreading of Asphaltic Emulsion
610.5.3 Spreading the Aggregate
610.5.4 Rolling
610.5.5 Manhole and Valve Box Covers
610.5.6 Removing Loose Aggregate
610.5.7 Straight Ends
610.6 Measurement
610.7 Payment

611 Crack Sealing of Asphaltic Concrete Pavements
611.1 Scope of Work
611.2 General
611.3 Materials
611.4 Equipment
611.5 Construction
611.5.1 General
611.5.2 Routing or Sawing
611.5.3 Crack Cleaning
611.5.4 Sealing Of Cracks
611.5.5 Debris Removal
611.6 Measurement
611.7 Payment

612 Cape Seal Surface Treatment
612.1 Description
612.2 Scope of Work
612.3 General
612.4 Chip Seal Work
612.5 Removing Loose Aggregate
612.6 Slurry Seal Work
612.7 Measurement
612.8 Payment

601 - GENERAL

601.1 Scope

The work under this section shall include the construction of an asphaltic concrete pavement or surface on a prepared foundation, base course, or existing surface. The work shall be in accordance with the specifications and contract and in conformity with the lines, grades, and typical sections as shown on the plans and in the Contract Documents.

Also included under this section is the work associated with the repair of existing asphaltic concrete pavements; the placement of asphaltic concrete wedging and overlays; and the construction of slurry seal, chip seal (seal coat), and crack filling of existing asphaltic concrete roadways.

601.2 Standard Wisconsin DOT Specifications

Except as hereinafter otherwise noted, the following sections of the State of Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction - latest edition, with all current supplemental specifications, are, by reference, made a part of these specifications. The aforementioned standard specification is hereinafter referenced as the "Wisconsin DOT Specifications" or as "WDOT".

WDOT SECTIONS	TITLE
450	General Requirements for Asphaltic Pavements
455	Asphaltic Materials
460	Hot Mix Asphalt Pavement
465	Asphaltic Surface
475	Seal Coat
490	Salvaged Asphaltic Pavement

Within the sections of the WDOT Specifications listed above, the term "department" shall mean the "City".

601.3 Earthwork, Grading, and Graveling

The preparation of road beds, including earthwork, grading, and graveling, shall conform to the requirements of Section 300 of these Standard Specifications.

601.4 Job Mix Design and Samples

The Contractor shall provide the Engineer with a job mix design for the asphaltic concrete, along with material sources, prior to beginning any asphaltic concrete work. The job mix design report shall establish the Job Mix Formula (JMF) for the work under the contract.

The Contractor shall notify the Engineer prior to preparing the asphaltic concrete mix for work under the contract. The Engineer may then send an authorized representative to the plant site to sample materials and inspect the operation of the plant for work under the contract. The Contractor shall place all of his facilities at the disposal of the representative so that the representative may ascertain the quality of materials and workmanship for work under the contract.

The job mix design report shall contain, as a minimum, the following information.

1. Mix design number and date.
2. Source of aggregates.
3. Gradation of aggregates.
4. Type, source, and specific gravity of bitumen.
5. Percent of asphalt content and recovered penetration of recycled asphalt pavement (if applicable).
6. Average Marshall test data.
7. Recommended optimum asphaltic cement content.
8. Marshall test data of optimum asphaltic cement content, including bulk specific gravity and unit weight.
9. Percent of air voids in the mix.
10. Percent of voids in mix aggregate.
11. Authorized signature of the supplier of the asphaltic concrete.

The Contractor shall take daily samples of the mixed asphaltic concrete at the time and location directed by the Engineer and shall submit the samples to the Engineer. The Contractor shall remove the samples with a clean shovel from the center half of the asphaltic concrete lift placed by the paver. The samples shall be taken before compacting the mat and shall be composed of the total thickness of the lift. Each time a sample is to be taken, the Contractor shall fill three (3) sample containers for City use. Each sample shall weigh between eight (8) and twelve (12) pounds. The Engineer will mark the identity of all samples, may test one sample, and will keep two samples for testing if the first sample fails. The Engineer may decide not to have the samples tested. The Engineer will supply the sample containers. Copies of test results will be available to the Contractor and will be forwarded to him upon his request. All costs associated with providing mix designs and taking samples shall be incidental to the bid price for pavement work.

Within three (3) working days after paving, the Contractor shall provide the Engineer with a copy of the results of any tests made on samples taken on the production run of the asphaltic concrete mix or of any adjustments made to the Job Mix Formula for the day on which the mix was supplied for the project.

601.5 City's Authorized Representative

The Engineer is empowered by the City to order any adjustments of materials and operation necessary, in his opinion, for the work to conform to the requirements of the specifications.

601.6 Notices to the Public

The Contractor shall notify all residences, businesses, and institutions that are located along the streets to be chip sealed, slurry sealed, or overlaid at least forty-eight (48) hours prior to beginning the resurfacing operations. Said notification shall advise the public of the following:

1. The approximate time that traffic, parking, ingress, and/or egress will be restricted and a description of the restriction,

2. When the work will be done if weather does not allow resurfacing at the scheduled time,

3. Any precautions the public needs to take when using the resurfaced roadway to prevent damage to the new roadway surface,

4. Any other information the Contractor deems important.

If, after notifying residences, businesses, and institutions along the roadways to be resurfaced, the resurfacing is rescheduled, the Contractor shall re-notify them of the new resurfacing date at least twenty-four (24) hours prior to beginning the resurfacing operation.

601.7 Two-Phased Paving

If the surface course of asphaltic concrete pavement will not be installed during the same calendar year as the binder course(s), the Contractor shall install the manhole frames so that their rim elevations are one-eighth (1/8) inch to one-fourth (1/4) inch below the surface of the binder course. Prior to the surface course of pavement being installed, the Contractor shall adjust the manhole rim elevations using cast iron adjusting rings and in accordance with Section 413.5.1.

If the surface course of asphaltic concrete pavement will not be installed during the same calendar year as the binder course(s), the Contractor shall protect the flange line edges of the curb and gutter from snow plow damage by placing and compacting asphaltic concrete pavement along the flange line edges to form a sloped ramp. The top of the ramp shall be flush with the top of the flangeline edge, and the ramp shall be a minimum of two (2) feet in width. By milling, the Contractor shall remove the ramps prior to placing the surface course of pavement.

602.0 - DESCRIPTION OF ASPHALTIC CONCRETE MIXES

602.1 General

Unless otherwise specified in the Contract Documents, the asphaltic concrete mixes shall conform to the requirements of WDOT 460 of the 2003 Edition of the Wisconsin DOT Specifications.

602.2 Residential Streets

Unless specified otherwise in the Contract Documents, for streets with right-of-way width at sixty-six (66) feet or less (residential streets), the asphaltic concrete pavement shall be Type E-0.3 conforming to the following additional requirements:

1. For binder course use E-0.3-19mm (3/4").

2. For surface course use E-0.3-9.5mm (3/8").

3. For full depth or partial depth patches use E-0.3-19mm (3/4") or E-0.3-12.5mm (1/2").

4. For overlays and wedging use E-0.3-9.5mm (3/8").

5. For binder course E-1-19mm (3/4") may be used in lieu of E-0.3-19mm (3/4").

602.3 Collector Streets

Unless specified otherwise in the Contract Documents, for street with right-of-way width greater than sixty-six (66) feet and at eighty (80) feet or less (collector streets), the asphaltic concrete pavement shall be Type E-1 conforming to the following additional requirements:

1. For binder course use E-1-19mm (3/4").

2. For surface course use E-1-12.5mm (1/2").

3. For full depth or partial depth patches use E-1-19mm (3/4") or E-1-12.5mm (1/2").

4. For overlays and wedging use E-1-12.5mm (1/2").

602.4 Arterial and Industrial Streets

For streets that are classified as arterials or industrial streets, the pavement shall be as specified in the Contract Documents.

602.5 Quality Control Program

The Contractor shall provide and maintain a quality control program in conformance with WDOT 460.2.8 for production and placement of asphaltic concrete pavement.

The Contractor shall furnish the Engineer with copies of the results of all tests and control charts required of the Contractor by WDOT 460 for the asphaltic concrete used on the contract.

All costs associated with the Contractor providing his quality control program in accordance with WDOT 460 shall be included in the contract unit price for the bid item of the asphaltic concrete pavement that uses the mix.

603 - MATERIALS FOR ASPHALTIC CONCRETE

603.1 General

All aggregates, salvaged asphaltic pavement materials, and asphaltic materials intended for use in base, binder, or surface courses of asphaltic concrete, and in tack or seal coats, surface treatments, and similar work shall conform to the requirements of WDOT 455 and WDOT 460.

603.2 Nonconforming Mixes

Unless otherwise specified in the Contract Documents, this subsection 603.2 shall become effective on January 1, 1994.

If the test results of the samples tested by the Engineer under Section 601.4 are outside the acceptable JMF control limits indicated in Table 600-1, additional testing shall be performed as described below.

1. The Engineer shall select a testing laboratory which is acceptable to the Owner and Contractor and which will perform all additional testing.

2. The two backup samples retained by the Engineer shall be tested. The test values for each item listed in Table 600-1 for the two backup samples and the original sample shall be added together and averaged to define the values of the "Averaged Sample".

3. If the test values of the Averaged Sample are within the JMF control limits indicated in Table 600-1, the asphaltic concrete shall be considered satisfactory.

4. If the test values of the Averaged Sample are outside the acceptable JMF control limits, the Contractor shall take two additional samples from the asphaltic concrete pavement placed on the project using the same lot as the previous test samples discussed above. The taking of said samples must be witnessed by and meet with the approval of the Engineer. The Engineer will send these additional samples to the testing laboratory for testing. The test values for each item listed in Table 600-1 for these two additional samples and the values for the Averaged Sample of step 2 above shall then be added together and averaged to define the values of the Final Averaged Sample.

5. If the test values of the Final Averaged Sample are within the JMF control limits indicated in Table 600-1, the asphaltic concrete shall be considered satisfactory.

6. If the test values of the Final Averaged Sample are outside the acceptable JMF control limits, all materials using that lot of nonconforming asphaltic concrete mix will be considered unacceptable and shall be removed and replaced by the Contractor at no additional cost to the Owner. The Engineer will determine the quantity of material to be replaced based on the project testing data and an inspection of the completed pavement. If the Engineer decides to leave the nonconforming materials in place, the asphaltic concrete will be paid for at seventy-five (75%) percent of the contract unit price for the asphaltic concrete. If the nonconforming materials are placed in a private development requiring acceptance by the City and if the Engineer decides to leave the nonconforming materials in place, the Developer shall pay to the City an amount equal to the quantity of nonconforming pavement multiplied by 0.25 times the average unit price submitted by the bidders awarded contracts for similar pavement on public works projects in the City during the year in which the pavement is placed and during the preceding calendar year. If the non-conforming pavement occurs in a layer not at the finish surface, the cost shall be based upon the cost of the non-conforming layer plus all layers placed above the non-conforming layer.

7. If the asphaltic concrete is unacceptable, as determined above, the Contractor shall pay for all sample testing except for the tests of the one sample originally tested by the Engineer and for the Engineer's time used to obtain and analyze the four additional samples.

8. If the asphaltic concrete is acceptable, as determined above, the Contractor and Owner shall each pay for fifty (50%) percent of the additional sample testing beyond the test of the one sample originally tested by the Engineer.

TABLE 600 - 1

CONTROL LIMITS

The following control limits shall apply to the Job Mix Formula (JMF).

Item		JMF Control Limit Differences
Aggregate Gradations:	Sieve Size	
	1 1/2" (37.5 mm)	±6.0% passing by weight
	1" (25.0 mm)	±6.0% passing by weight
	3/4" (19.0 mm)	±5.5% passing by weight
	1/2" (12.5 mm)	±5.5% passing by weight
	3/8" (9.5 mm)	±5.5% passing by weight
	#8 (2.36 mm)	±5.0% passing by weight
	#200 (75 microns)	±2.0% passing by weight

Asphalt Content ± 0.4%

Air Voids ± 1.3%

Voids in the Mineral Aggregate (VMA) -1.5%

The JMF control limit for each item shall be calculated by adding and subtracting the above listed differences to and from the respective values established in the job mix formula.

604 - TRANSPORTATION OF MIXTURES

Asphalt mixtures shall be transported from the mixing plant to the point of use in vehicles with metal bottoms and tight, insulated bodies previously cleaned of all foreign material. Inside surfaces of vehicles may be lightly coated with oil before loading, but an excess of oil will not be permitted. During long hauls or when hauling in cool weather, the loads shall be covered with a suitable material to protect them from excessive cooling. No load shall be sent out so late in the day as to prevent completion of spreading and compacting of the mixture during daylight hours, unless lighting satisfactory to the Engineer is provided.

The mixtures shall be delivered promptly to the point of use and the temperature of the mixture while still in the truck, but immediately prior to being used, shall be a minimum of 250° F. and a maximum of 350° F.

During construction, the Contractor shall furnish to the Inspector on the job site a delivery ticket for each load of asphalt mixture delivered to the job. This delivery ticket shall show the date and time of the load, truck number, load number, material specification reference, net weight of the load, and the project to which the load is intended.

In the case of a truck load that is only partially used on the job, the amount of material remaining in the truck shall be ascertained, and the amount actually used shall then be marked on the delivery ticket. The Contractor or his representative and the Inspector shall then sign the partial load delivery ticket in verification thereof.

605 - CONSTRUCTING ASPHALTIC CONCRETE PAVEMENTS

605.1 Foundation for Flexible Base Course

When the foundation is an earth sub-grade, constructed under the contract or under prior separate contract, it shall be prepared or restored by removing all vegetation, excavating and removing materials of whatever nature encountered above the required elevations, excavating areas of yielding, unstable, or unsuitable materials and backfilling with material approved by the Engineer, filling all depressions occurring below the required elevations and smoothing, shaping and compacting the sub-grade to the required grade, section and density. The foundation shall be proof rolled in accordance with Section 301.7.

The preparation of the foundation shall include such necessary scarifying, blading, leveling, and rolling as may be required to bring the foundation to the required grade and cross-section as shown on the plans and in the specifications. A uniform density, as specified by the Engineer, throughout the section, shall be achieved by use of steel wheel rollers or pneumatic-tired rollers. See Section 300 for compaction requirements of the subgrade. The rollers used shall have a minimum unballasted weight of eight (8) tons. Any ruts or surface irregularities in the foundation, produced by hauling equipment or other traffic, shall be removed, and any soft or yielding areas, holes, or other defects which may develop in the foundation by reason of traffic, hauling, poor drainage, unstable materials, or from any other cause, shall be corrected before the base course is placed thereon.

The preparation of the foundation shall precede the base laying operation by a sufficient distance so as not to hinder base construction.

605.2 Foundation for Asphaltic Concrete Surfacing

605.2.1 Crushed Aggregate Base Courses

The surface of the crushed aggregate base course shall be scarified, shaped, and compacted where and as necessary to effect the required cross-section contours, a profile free from abrupt changes in elevation, and a surface free from pits, hollows, depressions, or projections above the normal surface.

The shaping shall be performed by long wheel base blade graders or motor graders. Compaction shall be performed by steel wheeled or pneumatic tired rollers having a minimum unballasted weight of eight (8) tons. See Section 300 for compaction requirements of the base course.

The Contractor shall proofroll the crushed aggregate base course as per Section 301.7 of these Standard Specifications prior to placing the first lift of pavement.

605.2.2 Asphaltic Treated Surfaces and Pavements

Sections of existing asphaltic surfaces which are to remain in place, shall be prepared by removing all loose pieces and all localized areas which exhibit a tendency to ravel, shove, bleed or are otherwise unsuitable, in the opinion of the Engineer, to serve as a base for the proposed resurfacing.

Asphaltic treated surfaces and pavements shall be completely prepared, cleaned, and swept prior to application of the tack coat.

605.2.3 Concrete Pavements and Bases

All surplus crack and joint sealing material shall be removed from the surface of the pavement and all protruding joint materials, including fillers and sealers, shall be removed from joints and cracks to at least the surface of the old concrete.

Unstable patches of asphaltic materials used to fill localized pits, depressions, or badly spalled or disintegrated areas of the old pavement, shall be completely removed to the underlying concrete.

These areas shall then be tack coated, filled with approved asphaltic concrete mixture, and compacted. Loose concrete or concrete with incipient spalling within or contiguous to such an area shall be removed and replaced with concrete or an approved asphaltic concrete mixture.

605.2.4 Uneven Pavements

All required corrections to the existing pavement such as filling pot holes, depressions, and sags, and alterations of existing pavement crown in order to provide a foundation of required section and density shall be made after the correction areas are tack coated. All corrections shall be made prior to placing tack coats and asphaltic concrete on any existing pavement foundation. Asphaltic concrete mixtures used in wedging or leveling courses may be placed by hand, blade grader, or mechanical spreader methods, and shall be feathered out to become flush with contiguous areas and shall be uniformly compacted.

605.3 Tack Coat

Except for situations described in the next sentence, a tack coat shall be applied prior to the placement of all lifts of asphaltic concrete placed on existing paved surfaces. If the previous lift of pavement is clean and was placed on the same day as the next lift, tack coat is not required between the two lifts. The asphaltic material for tack coats shall be Type SS-1 or SS-1h Emulsified Asphalt. Anionic and cationic emulsions shall conform to the requirements of the Specifications for Emulsified Asphalt, AASHTO Designation M140 and M208, respectively. The tack coat utilized by the Contractor shall be compatible with the asphaltic concrete mix. The emulsion shall be diluted with an equal amount of water.

Prior to the application of the tack coat, the surface to be treated shall be cleaned and swept with a power broom to remove all loose and foreign materials. All joint and crack sealing material protruding above the surface shall be removed. After sweeping and prior to applying the tack coat and using tape, the Contractor shall seal the seam between the rim and cover of all manholes, catch basins, and valve boxes located within the areas to be tack coated. The Contractor shall remove the tape after the placement and compaction of the asphaltic concrete pavement.

When using emulsified asphalt for a tack coat, the surface does not need to be dry, but shall be free from standing water. When it appears probable that the tack coat may be exposed to rain during the penetration or curing period, the surface shall not be tacked and no asphaltic concrete shall be placed. If rain washes the tack coat off, the Contractor shall reapply the tack coat.

Tack coats shall be applied at the application rates listed below for the following types of surfaces being tack coated. Adjustment of the application rate may be allowed by the Engineer, within a reasonable tolerance, as project conditions dictate.

TACK COAT APPLICATION RATES

Surface Being Coated	Application Rate (gal./sq. yd.)
Concrete Pavement	0.10
Asphaltic Concrete Pavement	0.15
Brick Pavement	0.20

Unnecessary traffic shall be excluded from the treated surface for a period sufficient to allow for proper penetration or curing. Asphaltic concrete shall not be placed before the tack coat has cured to the point where it is tacky to the touch. If at the end of the normal curing time the surface has not completely absorbed the tack coat material, the excess material shall be blotted with sand.

The tack coat shall not be applied when the atmospheric temperature is below 40° F. In no case shall application be made to frozen surfaces.

All contact surfaces of curbings, gutters, manhole frames, and other structures within the area to be surfaced shall be painted with hot asphalt cement or hot emulsified asphalt. The surfaces of all structures, curbs, gutters, and concrete pavements adjacent to the areas to be tack coated shall be protected by the Contractor to prevent being spattered or marred by the tack coating operations.

During construction the Contractor shall furnish the inspector on the job site with a delivery ticket for each load of tack material delivered to the job. This delivery ticket shall show

the date of delivery; truck number; class, type, and grade of material delivered; temperature; number of gallons delivered; and the project to which the load is intended.

605.4 Placing Asphaltic Concrete Paving Mixtures

605.4.1 Preparation

Prior to arrival of the asphaltic concrete, the surface to be paved shall be cleaned of all foreign and loose materials. The surface shall be dry and the atmospheric temperature shall conform to the requirements of WDOT 450.3.2.1(2).

The asphaltic concrete paving mixture shall be laid only on a prepared, firm, and compacted base or foundation course.

Any asphaltic concrete paving mixture which, in the judgment of the Engineer, is not sufficiently mixed or is deficient in any manner and is delivered and placed on the road, shall be rejected.

No asphaltic concrete paving mixture shall be placed over frozen sub-grade, base, or pavement. Asphaltic concrete paving mixture shall not be placed when it is raining or snowing. Any mixture exposed to rain or snow before final rolling which has, in the judgment of the Engineer, been adversely affected thereby, shall be removed and replaced at the Contractor's expense.

Unless approved by the Engineer, no asphaltic concrete pavement may be placed adjacent to new concrete until either seventy-two (72) hours of curing time has occurred if the new concrete is high early strength concrete or until the new concrete has reached a compressive strength of 3500 psi as evidenced by a proof test cylinder break furnished by the Contractor at no extra cost to the City.

605.4.2 Spreading

A mechanical asphalt mixture paving machine conforming to WDOT 450.3.2.5 shall be used to spread the asphaltic concrete mixture.

The asphaltic concrete mixtures shall be placed in one or more courses to the typical sections as shown on the plans. The maximum and minimum thicknesses of separate leveling; lower and upper layers shall be as specified in WDOT 460.3.2, unless otherwise specified in the Contract Documents.

The operating speed of the paver, when placing any course, shall be subject to the approval of the Engineer and shall not exceed that speed which is appropriate to the type of paver and type of mixture used, to produce a uniformly spread and struck-off mixture having a smooth, dense texture, without tearing or segregation of the material. As nearly as possible, the paver shall maintain a speed which coincides with the average rate of delivery of asphaltic concrete material to the paver.

In succeeding courses, construction joints shall not be placed in the same vertical plane. Longitudinal joints shall be off-set at least six (6") inches, and transverse joints shall be off-set at least two (2') feet.

Hand methods may be used for spreading materials over areas inaccessible to pavers. The material shall be placed in the area by means of shovels or loaders and spread by rakes or lutes. Spreading by means of raking from a pile of dumped material shall not be permitted.

No traffic of any kind shall be permitted on the laid course until final rolling is completed.

605.5 Compaction

605.5.1 General
Compaction of asphaltic concrete pavement shall conform to the requirements of WDOT 450.3.2.6, using the Maximum Density Procedure.

605.5.2 Degree of Compaction
All asphaltic concrete pavements, overlays, patches, leveling courses, and wedges shall be compacted to a density not less than the percent density specified in Table 460-3 of WDOT 460.3.3.1.

605.5.3 Compaction Testing

605.5.3.1 General
The Contractor shall provide compaction testing on paving projects when paving more than 350 tons on any lift for City contracts and for private development projects in which the Developer is constructing public streets.

The City Engineer may waive compaction testing on any lot of pavement or any paving project. The City Engineer may obtain the services of a consultant to perform compaction testing on any paving project.

605.5.3.2 Contractor-Furnished Compaction Testing
When the Contractor is required to provide compaction testing, the compaction testing shall be performed in accordance with the requirements of this subsection.

The Contractor shall provide compaction testing on the asphaltic concrete pavement by utilizing a nuclear density gauge specifically designed to determine compaction. The Contractor shall provide written reports of said testing. The Contractor shall provide a nuclear density technician certified at Level 1 or higher, as specified in the current edition of the WDOT Quality Management Program Guide/Procedure Manual (QMP-GPM), to perform the compaction testing. The testing procedures and results shall be in accordance with the current edition of the WDOT QMP-GPM and as herein modified.

The Engineer will establish random testing locations during construction. Compaction tests shall be taken as soon as practical after placement and compaction and before placement of subsequent layers.

Nuclear density testing shall take place on both binder courses and the surface course of asphaltic concrete pavement, for a total of five (5) random sets of tests taking place on each lot of the asphaltic concrete pavement placed. The compaction tests shall be staggered on each course of asphaltic concrete so that no test is located in an identical location above or below another.

A lot shall represent 350 tons of a mixture placed within a single layer of asphaltic concrete pavement. Five (5) random tests shall be taken on each lot placed. The lot density is the average of all samples taken for that lot.

All tests shall be performed on a sufficiently prepared test area to accommodate the gauge. The test area shall be planed smooth and the Contractor shall remove all loose and/or disturbed material. When a void area exceeds one-sixteenth (1/16) inches in depth, the operator shall use native fines or fine sand to fill the voids and smooth the surface with a rigid plate or other suitable tool. The area filled beneath the gauge shall not exceed ten percent (10%) of the total area. The gauge shall be set flat on the surface with the longest dimension of the gauge parallel to the edge of the pavement.

The duration of the test shall be four (4) minutes (Seaman gauges, two (2) minutes contact and two (2) minutes air gap).

The results of the compaction testing shall be submitted on a form approved by the Engineer prior to the testing taking place. At a minimum, the Contractor shall provide the Engineer with a mix design report of the material being placed, the approximate station and approximate offset distance and direction (ie. Left, right) from the reference line, the minimum compaction required for the material being placed, and the compaction result (reported in pounds per cubic foot).

All costs associated with the compaction testing and reporting for asphaltic concrete pavement by the Contractor shall be included in the unit price for constructing the pavement.

605.6 Measurement and Payment

Measurement and payment for construction of asphaltic concrete pavement will be made per square yard for the specified thickness or per ton of constructed pavement as specified in the Contract Documents.

The contract unit price for constructing asphaltic concrete pavement shall include all costs associated with cleaning the surface to be paved; for taping seams of manholes, valve boxes, and catch basins and of holes in lids of sanitary sewer manholes; furnishing, preparing, hauling, mixing, and placing of all materials, including tack coats; for compacting all mixtures; for job mix design and daily samples; and for all labor, supervision, tools, equipment, supplies, and incidentals required to complete the paving work.

When the density of a lot of compacted binder course, surface course, wedging, or overlay of asphaltic concrete is less than the specified minimum, the City may make payment at an adjusted unit price calculated in accordance with WDOT 460.5.2.2.

606 - REPAIRS OF ASPHALTIC CONCRETE PAVEMENTS

606.1 Scope of work

The work under this section shall consist of repairs to existing asphaltic concrete pavements at the locations and as specified in the bidding documents and as provided in the contract. Such repairs may include:

1. Full depth patches of asphaltic concrete pavement.
2. Partial depth patches of asphaltic concrete pavement.
3. Asphaltic concrete wedges.
4. Crackfilling.
5. Milling.
6. Paving Fabric.

The contractor shall furnish all labor, supervision, equipment, materials, tools, supplies, and incidentals required to complete the specified repairs of existing pavements.

606.2 Full Depth Patches of Asphaltic Concrete Pavement

606.2.1 General

When full depth patches are to be made in existing asphaltic concrete pavement, the Contractor shall remove the existing pavement, add base and subbase materials, recompact the base and subbase, and replace the pavement with new asphaltic concrete pavement. The asphaltic concrete pavement shall be patched using at least two (2) lifts conforming to the thickness requirements indicated in WDOT 460.3.2.

Prior to starting a full depth patch at a sanitary manhole, the Contractor shall tape any holes in the lid of the manhole.

Where pavement restoration is to be made at curb and gutter, sewer pipe, manhole, and catch basin repairs and replacements,

the pavement is to be restored to the thickness of existing pavement on the street where the work is located.

Areas of existing pavement to be repaired will be determined and marked by the Engineer prior to any pavement repair work beginning. Any pavement repair completed outside of the repair limits without prior approval from the Engineer will not be included in the quantity for payment of pavement repair.

606.2.2 Saw Cutting

Prior to removal of existing pavement and/or prior to placement of new pavement, the contractor shall saw cut existing pavement bounding the repair area to form straight edges that are parallel and perpendicular to the centerline of the pavement. The sawcut shall be a minimum of two (2) inches deep. The sawing operation shall be performed so that the surface to remain is generally vertical for its full depth.

606.2.3 Repair of Base and Subbase

At areas to be full depth patched, the Contractor shall remove and dispose of any unsuitable existing base and subbase materials. The Contractor shall replace such removed subbase materials with materials of type equivalent to or better than the surrounding roadway subbase materials. The suitability of the existing base and subbase materials and of the replacement materials shall be subject to the approval of the Engineer. The Contractor shall add sufficient crushed stone base materials to restore the road base in preparation for the patching work.

606.2.4 Temporary Surfaces of Patch Areas

After the existing pavement has been removed at the pavement patch location, the Contractor shall complete the repair work in such a manner as to cause a minimum inconvenience to traffic and to the general public. Once a patch has been opened, it shall be backfilled to the level of the surrounding pavement surface before dark on the day the patch is opened.

If any portion of the patch is located more than six (6) feet from the edge of the roadway and if the permanent patch will not be placed within twenty-four (24) hours after the patch has been opened, the Contractor shall apply temporary asphalt to the area until the area receives its permanent patch. If the entire patch is located six (6) feet or less from the edge of the roadway or is in a location subject to concentrated storm water flow, and if the permanent patch will not be placed within seven(7) calendar days after the patch has been opened or before impending rain, the Contractor shall apply and maintain temporary asphalt to the area. The Contractor shall maintain the temporary asphalt surface until the permanent patch is completed.

606.2.5 Tack Coat

The Contractor shall apply tack coat to the vertical edges of each patch area prior to patching. The tack coating materials and application shall conform to the requirements of Section 605.3.

606.2.6 Placement of Patches

The Contractor shall place the asphalt concrete patches in conformance to the requirements of Section 605.4.

606.2.7 Compaction

The Contractor shall compact the subbase, base, and the asphaltic concrete to conform to the requirements of Section 305 for the base and subbase and Section 605.5 for the asphaltic concrete.

606.2.8 Measurement

Measurement of full depth patching of asphaltic concrete pavement will be made per square foot of pavement area patched for the various thicknesses of patches.

606.2.9 Payment

Payment for full depth patching of asphaltic concrete pavement shall be made per square foot of accepted pavement area patched for the thickness of the patch. The contract unit prices for the appropriate thicknesses of full depth patching shall include all costs for saw cutting; hauling and properly disposing of removed pavement and up to two (2) inches of base materials off site; furnishing, placing, and compacting base materials and temporary surfacing; furnishing, preparing, hauling, mixing and placing tack coat and replacement pavement materials; compacting the patch pavement; job design mix and daily samples; and for all labor, supervision, materials, tools, equipment, supplies and incidentals necessary to complete this work.

If the base repair work extends deeper than two (2) inches below the bottom of the proposed pavement patch, the base repair work shall be extra work if no price has been established in the contract for such work.

If a price for base repairs has been established in the Contract Documents, such price shall include all costs for removing, hauling, and properly disposing of the base (and subbase materials, if needed) offsite; furnishing, placing, and compacting the replacement materials; and for all labor, supervision, materials, tools, equipment, supplies, and incidentals to complete the base repair work.

606.3 Partial Depth Patches of Asphaltic Concrete Pavement

606.3.1 General

Where partial depth patches are to be made in existing asphaltic concrete pavement, the Contractor shall remove sufficient thickness of existing pavement and replace it with new asphaltic concrete pavement. Patch thicknesses, number of lifts, type of asphalt concrete, saw cutting, tack coating, and compaction shall conform to the requirements of the appropriate subsections of Section 606.2

606.3.2 Measurement

Measurement of partial depth patching of asphaltic concrete pavement will be made per square foot of pavement area patched for the various thicknesses of patches.

606.3.3 Payment

Payment for partial depth patching of asphaltic concrete pavement shall be made per square foot of accepted pavement area patched for the thickness of the patch. The contract unit prices for the appropriate thicknesses of partial depth patching shall include all costs for saw cutting; hauling and properly disposing of removed pavement materials off site; furnishing, placing, and compacting temporary surfacing; furnishing, preparing, hauling, mixing and placing tack coat and replacement pavement materials; compacting the patch pavement; job design mix and daily samples; and for all labor, supervision, materials, tools, equipment, supplies, and incidentals necessary to complete this work.

606.4 Asphaltic Concrete Wedges

606.4.1 General

The wedging work of this section includes level wedging and overlay wedging.

The term "level wedging" refers to wedging work whereby asphaltic concrete materials are placed in low areas of the existing pavement to make the pavement surface level with the elevation of the surrounding pavement surfaces. Also included in level wedging work is the placement of asphaltic concrete along curb and gutter lines to smooth out surface irregularities, improve roadway slope, and to improve storm water drainage.

The term "overlay wedging" refers to wedging work whereby asphaltic concrete materials are placed on the roadway to raise the surface of the road and often results in the adjustment of manhole elevations to accommodate the added materials. Also included in "overlay wedging" is the addition of asphaltic concrete to form ramps at high manholes and other structures or at high adjacent pavement areas.

Areas to be wedged will be determined and marked by the Engineer prior to beginning any wedging work. The Contractor shall note that any wedging completed outside of the wedging limits without prior approval from the Engineer will not be included in the quantity for payment for wedging.

606.4.2 Surface Preparation

Prior to wedging, the surface of the existing pavement shall be prepared in conformance with Section 607.

606.4.3 Tack Coat

The Contractor shall apply tack coat to the existing pavement surface before it is wedged. The tack coating materials and application shall conform to the requirements of Section 605.3.

606.4.4 Placement of the Wedging

The Contractor shall place the asphaltic concrete wedging in accordance with the requirements of Section 605.4.

606.4.5 Compaction

The Contractor shall compact the asphaltic concrete wedging to conform to the requirements of Section 605.5.

606.4.6 Manhole and Valve Box Adjustments

The Contractor shall adjust all manhole and valve box extensions located within the area being wedged so that they are one-eighth (1/8") inch to one-quarter (1/4") inch below the finished surface of the pavement. The adjustments shall be made, measured, and paid for in accordance with the requirements of Section 413.5 for manholes and 413.7 for valve boxes.

606.4.7 Measurement

The measurement of asphaltic concrete wedging will be made per ton in place, supported by proper truck delivery tickets.

606.4.8 Payment

Payment for asphaltic concrete wedging shall be made per ton of asphaltic concrete materials used in areas wedged within the marked wedging limits. The contract unit prices for wedging shall include all costs for surface preparation; for furnishing, preparing, hauling, mixing, and placing wedge material and tack coat; for compacting mixtures; for job design mix and daily samples; and for all labor, supervision, materials, tools, equipment, supplies, and incidentals required to complete the wedging work.

When the density of a lot of compacted asphaltic concrete wedging is less than the specified minimum, the City may make payment at an adjusted unit price calculated in accordance with WDOT 460.5.2.2.

606.5 CrackSealing Before Resurfacing

606.5.1 General

The Contract Documents usually specify whether or not the existing pavement is to be crack sealed prior to resurfacing. Pavements which are to be wedged or overlayed shall not be crack sealed in the areas to be covered with the new asphaltic concrete.

Unless otherwise specified in the Contract Documents, all crack sealing work shall conform to the requirements of Section 611, and routing or sawing of the cracks will be required. If specified in the Contract Documents, pavements which are to be slurry sealed or chip sealed after crack sealing may not need to have the cracks routed or sawed prior to placing the crack sealing material.

606.5.2 Measurement and Payment

Measurement and payment for crack sealing work before resurfacing shall be per pound of crack seal material placed on the pavements or per unit in place, as specified in the Contract Documents. The contract unit price for Furnish and Place Crack Sealing Material shall include all costs for routing, sawing, crack cleaning, lancing, and crack sealing; for furnishing manufacturer's certificates; and for all labor, supervision, materials, equipment, supplies, tools, and incidentals necessary to complete the crack sealing work.

606.6 Milling

606.6.1 General

This section covers the work of milling existing asphaltic concrete pavements to level out surface irregularities or to prepare the existing pavement for resurfacing.

Each street that is to receive an asphaltic concrete overlay generally will have milled butt joints across the street at the project limits and milled edges along the length of the street. Said milling shall be of the depths and widths specified in the Contract Documents. The butt joint locations will be marked by the Engineer prior to construction.

The Contractor shall do all the milling work specified in the Contract Documents.

Prior to milling (or pulverizing), the Contractor shall tape any holes in the lids of sanitary manholes.

After milling, the Contractor shall clear the gutters and roadway and shall blow out all vegetation and debris along the gutter flange lines. The Contractor shall remove all grindings and debris at the end of each work day. Flushing into the City's storm sewer system as a means of clean-up will not be allowed.

Millings shall become the property of the Contractor, and it is the responsibility of the Contractor to dispose of them properly.

Butt joints shall be temporarily ramped or filled with either millings or cold mix. The ramped or filled butt joints shall be maintained by the Contractor to ensure a smooth transition between the milled surface and existing pavement. At the time paving is to take place, all millings or cold mix shall be completely removed from the butt joint.

606.6.2 Measurement

Pavement surfaces that have been milled shall be measured by the square yard. The milling width for payment quantities shall be as specified in the Contract Documents and no payments will be made for milling wider than the width limits or for milling other areas not specified in the contract, unless approved in writing by the Engineer prior to the milling.

No deductions shall be made for the surface area of manholes and valve boxes within the limits of the area milled.

606.6.3 Payment

Payment for milling will be made per square yard of accepted milling area for the specified milling depths. The contract unit prices for milling shall include all costs associated with the milling; clearing and cleaning the milling work area; hauling, disposal, and/or delivery of millings; and for all labor, supervision, materials, equipment, supplies, tools, and incidentals necessary to complete the milling work.

606.7 Paving Fabric

606.7.1 General

If paving fabric is to be used on a project, the location, type, and dimensions will be as specified in the Contract Documents.

The Contractor shall place the paving fabric on the existing pavement at the locations specified. Prior to placing the fabric, the Contractor shall sweep clean the pavement surface and, unless otherwise specified in the Contract Documents, shall seal all cracks that will be covered by the paving fabric and are wider than 1/4 inch in accordance with Section 606.5. The paving fabric shall be of the specified width. In the area to receive the paving fabric the pavement patching work shall be completed before the paving fabric is placed and the pavement wedging or resurfacing work shall immediately follow the placing of the paving fabric.

A tack coat shall be applied prior to placing the paving fabric, shall be compatible with the paving fabric, and shall conform to the requirements of Section 605.3.

The Contractor shall follow the manufacturer's recommended procedures for applying the tack coat and placing the fabric. If the tack coat bleeds through the fabric before additional asphaltic concrete is placed, the sealant shall be blotted with asphaltic concrete to prevent construction equipment from picking up the fabric when driving over it. There shall be no sharp turning movements of the paver or other vehicles over the placed paving fabric.

606.7.2 Measurement and Payment

Measurement and payment for placing the paving fabric will be made per square yard in place. The maximum width of paving fabric to use in calculating the payment quantity shall be the width specified in the Contract Documents. Any paving fabric width in excess of this limit shall not be included in the payment quantity. The contract unit price for Furnish and Install Paving Fabric (of the specific roll width) shall include all costs of preparing the surface, furnishing, transporting, and installing the tack coat and paving fabric, and for all labor, supervision, materials, tools, equipment, supplies, and incidentals required to complete the work.

607 - SURFACE PREPARATION

On pavements that are to be resurfaced with asphaltic materials by overlaying, wedging, chip sealing (seal coating), slurry sealing, cape sealing, or other method, and on streets that are to be repaved, the Contractor shall prepare the surface and protect manholes, catch basins, and valve boxes in accordance with the following requirements.

Immediately prior to applying the asphaltic materials, the Contractor shall thoroughly clean the existing pavement surface and all pavement cracks, including the crack along the gutter flange lines, of all loose material, silt, vegetation, and other objectionable material. Dust and other loose material in depressions or other places not reached by mechanical sweepers shall be swept with hand brooms or by blowers or flushers. Particular care shall be taken to thoroughly clean the outer edges of the area to be resurfaced. Material removed from the surface shall not be mixed with the resurfacing materials and shall be removed and properly and legally disposed of off site by the Contractor.

Prior to milling, pulverizing, or placement of asphaltic concrete pavement, the Contractor shall tape any holes in the lids of sanitary manholes. Prior to placing tack coat, slurry seal, or chip seal, the Contractor shall tape any holes in the lids of sanitary sewer manholes and the seams between the rim and frame of all manholes, valve boxes, and catch basins in the work area in accordance with Sections 605.3 for tack coating before placement of asphaltic concrete pavement, 609.9.6 for slurry seals, and 610.5.5 for chip seals.

After the asphaltic material has been placed, the Contractor shall remove and properly dispose of the tape used on the seams, shall test open each manhole, catch basin, and valve box cover and, where necessary, remove any asphaltic material which may have accumulated in the lifting holes, at the bottom of manholes, catch basins, and valve boxes, or along the frame-to-cover interface from the operations associated with the placement of the asphaltic materials.

No asphaltic materials may be placed on the pavement to be resurfaced until the surface preparation meets with the Engineer's approval.

On projects that include construction of new pavement or full removal and replacement of existing pavement, in lieu of taping manholes and catch basins, the Contractor may use Type FF (WisDOT 628.2.12) geotextile fabric installed under the covers and grates to prevent debris entering the structure.

All costs associated with the surface preparation and with the protection and cleanup of the manholes, catch basins, and valve boxes shall be included in the unit prices for the pavement work.

608 - ASPHALTIC CONCRETE OVERLAYS

608.1 Scope of Work

The work under this section shall consist of pavement repairs, surface preparation, manhole and valve box adjustments, and placement of an asphaltic concrete overlay upon existing pavements at the locations and as specified in the bidding documents and as provided by the contract.

The Contractor shall furnish all labor, supervision, equipment, materials, supplies, tools, and incidentals for the overlay work.

608.2 General

Prior to the placement of asphaltic concrete for the overlay, the Contractor shall make those pavement repairs (including patching, wedging, milling, and paving fabric) that are specified in the Contract Documents. Crackfilling shall not be done on pavements to be overlayed. Pavement repairs shall be made in accordance with Section 606.

In addition and prior to overlaying, the Contractor shall adjust all manhole and valve box extensions located within the area to be overlayed so that they are on-eighth (1/8") inch to one-quarter (1/4") inch below the finish surface of the overlay. The adjustments shall be made, measured, and paid for in accordance with the requirements of Section 413.5 for manholes and 413.7 for valve boxes.

608.3 Materials and Construction

The asphaltic concrete shall be of the type and laid to the thickness specified in the Contract Documents. The materials, transportation, placement, and compaction of the asphaltic concrete overlay, including tack coats, shall be in accordance with Sections 601 through 605 inclusively.

Prior to placing the overlay, the Contractor shall prepare the surface in accordance with Section 607.

608.4 Measurement and Payment

Payment for asphaltic concrete overlay will be made for in place overlay measured on a per square yard basis unless specified in the Contract Documents as being on a per ton basis.

The contract unit prices for asphaltic concrete overlay shall include all costs for surface preparation; for furnishing, preparing, hauling, mixing, and placing of all materials, including tack coats; for compacting all mixtures; for job mix design and daily samples; and for all labor, supervision, tools, equipment, supplies, and incidentals required to complete the overlay work.

When the density of a lot of asphaltic concrete overlay is less than the specified minimum, the City may make payment at an adjusted unit price calculated in accordance with WDOT 460.5.2.2.

609 - SLURRY SEAL SURFACE TREATMENT

609.1 Scope of Work

The work under this section shall consist of the surface preparation and application of a slurry seal surface upon existing asphaltic concrete pavement at the locations and as specified in the bidding documents and as provided by the contract.

The Contractor shall furnish all labor, supervision, equipment, materials, supplies, tools, and incidentals for the slurry seal work.

609.2 Applicable Specifications

The following specifications and test methods form a part of this specification. Alternate specifications are listed for most test methods and specifications.

The following abbreviations are used:

AASHTO -- American Association of State Highway Testing Officials

ASTM ---- American Society of Testing Materials

ISSA ---- International Slurry Surface Association

609.2.1 Test Methods for Aggregate and Mineral Filler

Alternate No. 1	Alternate No. 2	
AASHTO T2	ASTM D75	Sampling Stone, Slag, Gravel, Sand, and Stone Block for use as Highway Materials.
AASHTO T27	ASTM C136	Sieve Analysis of Fine or Coarse Aggregate.
AASHTO T11	ASTM C117	Amount of material finer than No. 200 sieve in aggregate.
AASHTO T176	ASTM D2419	Plastic fines in graded aggregates and soils by use of the Sand Equivalent Test.

609.2.1 Cont...

Alternate No. 1	Alternate No. 2	
AASHTO T84	ASTM C128	Specific gravity and absorption of Fine Aggregate.
AASHTO T19	ASTM C29	Unit weight of Aggregate.
AASHTO T96	ASTM C131	Abrasion of Coarse Aggregate, by use of the Los Angeles Machine.
AASHTO T127	ASTM C183	Sampling Hydraulic Cement.
AASHTO T37	ASTM D546	Sieve Analysis of ASTM D242 Mineral Filler.
AASHTO T104	ASTM C88	Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.

609.2.2 Test Methods for Asphalt Emulsions

Alternate No. 1	Alternate No. 2	
AASHTO T40	ASTM D140	Sampling Bituminous Materials.
AASHTO T59	ASTM D244	Testing Emulsified Asphalt.
AASHTO T182	ASTM D1664 or ISSA T114	Stripping Test for Bitumen Aggregate Mixtures

609.2.3 Test Methods for Asphaltic Slurry Surfaces

Alternate No. 1	Alternate No. 2	
AASHTO T164	ASTM D2172	Bitumen Content of Paving Mixture by Centrifuge
AASHTO T30		Mechanical Analysis of Extracted Aggregate

609.2.4 Specifications for Mineral Fillers

ASTM D242 Mineral Fillers for Bituminous Paving Mixtures.

609.2.5 Specifications for Asphalt Emulsions

Alternate No. 1	Alternate No. 2	
Asphalt Institute Specifications for Asphalt Emulsions for Mixing Grade Emulsions.	Federal Specifications SS-A-674b for Asphalt Emulsions for Mixing Grade Emulsions.	Specifications for Asphalt Emulsions for Mixing Grade Emulsions.

609.3 Description

The slurry seal surface shall consist of a mixture of emulsified asphalt, mineral aggregate, and water that is properly proportioned, mixed, and spread evenly on the surface as specified herein and as directed by the Engineer. The cured slurry shall have a homogeneous appearance, fill all cracks, adhere firmly to the surface and have a skid resistant texture.

609.4 Materials

609.4.1 Asphalt Emulsion

The emulsified asphalt shall be Type CSS1H or CQSIH Cationic emulsified asphalt conforming to the requirements of ASTM Specification D-2397 and AASHTO M208. The Contractor shall furnish a certified statement from the emulsion manufacturer giving the analysis of the base asphalt used in the manufacture of the emulsion.

The Theoretical Asphalt Content shall be 7.5% - 13.5% of the weight of dry aggregate.

609.4.2 Aggregate

The mineral aggregate shall consist of natural or manufactured sand, slag, crusher fines, and others, or a combination thereof. Smooth textured sand of less than 1.25 percent water absorption, when tested in accordance with ASTM C128, shall not exceed 50 percent of the total combined aggregate. The aggregate shall be clean and free from vegetable matter and other deleterious substances. When tested by AASHTO T176 or ASTM D 2419, the aggregate blend shall have a sand equivalent of not less than 45. When tested according to AASHTO T104 or ASTM C88, the aggregate shall not show a soundness loss exceeding fifteen (15%) percent by weight after five (5) cycles using sodium sulfate. When testing according to AASHTO T-96 or ASTM C131, the aggregate shall not show an abrasion loss exceeding forty (40%) percent by weight.

Mineral fillers such as Portland cement, limestone dust, fly ash, and other, shall be considered as part of the blended aggregate and shall be used in minimum required amounts. They shall meet the gradation requirements of ASTM D242. Mineral fillers shall only be used if needed to improve the workability of the mix, improve the gradation of the aggregate, or to adjust the setting time of the asphalt emulsion.

The combined mineral aggregate shall conform to the following gradation for Type 2 Slurry Seal Aggregate when tested by ASTM C136.

Sieve Size	Percent Passing
3/8	100
No. 4	90 - 100
No. 8	65 - 90
No. 16	45 - 70
No. 30	30 - 50
No. 50	18 - 30
No. 100	10 - 21
No. 200	5 - 15

609.4.3 Boiler Slag

If boiler slag is specified to be added to the aggregate mix, it shall be added at a rate not to exceed sixty-five (65%) percent nor less than forty (40%) percent of the aggregate mixture by weight.

609.4.4 Water

All water used with the slurry mixture shall be potable and free from harmful soluble salts.

609.4.5 Additives

Additives may be used to accelerate or retard the set of the slurry seal, or to improve the resulting finished surface.

609.4.6 Slurry Seal Mix Design

The Contractor shall submit the slurry seal mix design to the Engineer at least 10 days prior to beginning the work. The amount of asphalt emulsion shall be determined such that the resulting residual asphalt content is between 7.5 and 13.5 percent based on the dry weight of the aggregate. When used, mineral filler shall be between 0.5 and 2.0 percent based on the dry weight of the aggregate. The amount of water in slurry seal mix shall be as needed to achieve the proper mix consistency. The slurry seal mix shall have a set time less than 12 hours, a cure time less than 24 hours, and a wear value of less than 75 grams per square foot when tested in accordance with ASTM D3910.

The compatibility of the asphalt emulsion, aggregate, mineral filler, and other additives shall be verified by the mix design. Adjustments to the mix design may be required during the work, based on actual field conditions.

609.4.7 Laboratory Testing

The Contractor shall provide materials to be pretested by a qualified testing laboratory to determine their suitability for use in the slurry seal. A complete laboratory analysis report shall be submitted to the Engineer at least ten (10) days before the work begins.

The laboratory report shall indicate the following: 1) Theoretical residual asphalt content; 2) Whether mineral filler is required or not, and if so, what percentage of mineral filler should be used; and 3) Consistency, set time, cure time, and wet track abrasion test results based on testing in accordance with ASTM D3910.

609.4.8 Sampling

The Contractor shall take daily samples of the slurry mix at the time and location directed by the Engineer and shall submit the samples to the Engineer. The Engineer will supply the sample containers. Copies of test results will be available to the Contractor and will be forwarded to him upon his request.

609.4.9 Field Testing

During placement of the slurry seal, the Engineer may require field testing. Field testing to be performed may include determining the slurry seal application rate. Areas for field testing will be determined by the Engineer. Field tests shall utilize the same equipment and method of operation as will be used on the project.

609.4.10 Stockpiling of Aggregate

Precautions shall be taken to insure that stockpiles do not become contaminated with oversized rock, clay, silt, or excessive amounts of moisture. The stockpile shall be kept in areas that drain readily. Segregation of the aggregate will not be permitted.

609.4.11 Storage

The Contractor shall provide suitable storage facilities for the asphalt emulsion. The storage facilities shall be equipped to prevent water from entering the emulsion. Suitable heat shall be provided, if necessary, to prevent freezing.

The Contractor shall take precautions to keep the mineral filler dry, and from being exposed to excessive humidity or coming into contact with water.

609.5 Equipment

All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working order at all times. Descriptive information on the slurry mixing and applying equipment to be used shall be submitted for approval not less than ten (10) days before the work starts.

The Contractor shall provide operational slurry seal mixing equipment consisting of either a minimum of two (2) individual units that return to the stockpile for reloading or one (1)

continuous run unit that is resupplied at the job site by a minimum of two (2) haul trucks. The Contractor shall provide a backup operational spreader box during the work and store it within a ten (10) mile radius of the job site.

609.5.1 Slurry Mixing Equipment

The slurry mixing machine shall be a continuous flow mixing unit and be capable of delivering accurately a predetermined proportion of aggregate, water and asphalt emulsion to the mixing chamber and to discharge the thoroughly mixed product on a continuous basis. The aggregate shall be prewetted immediately prior to mixing with the emulsion. The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients together. No violent mixing shall be permitted.

The mixing machine shall be equipped with an approved fines feeder that provides an accurate metering device or method to introduce a predetermined proportion of mineral filler into the mixer at the same time and location that the aggregate is fed. The fines feeder shall be used whenever added mineral filler is a part of the aggregate blend. The mixing machine shall be equipped with a water pressure system and fog type spray bar adequate for completely fogging the surface ahead of the spreading equipment at a rate of 0.05 to 0.10 gallons per square yard.

Each slurry machine shall have sufficient storage capacity to mix properly and to apply a minimum of eight (8) cubic yards of the slurry shall be provided.

609.5.2 Slurry Spreading Equipment

Attached to the mixer machine shall be a mechanical type squeegee distributor equipped with flexible material in contact with the surface, to prevent loss of slurry from the distributor. It shall be maintained so as to prevent loss of slurry on varying grades and crown, by adjustments, to assure uniform spread. There shall be a steering device and a flexible strike-off. The spreader box shall have an adjustable width.

The box shall be kept clean, and build-up of asphalt and aggregate on the box shall not be permitted. The use of burlap drags or other drags, shall be subject to approval by the Engineer.

609.5.3 Cleaning Equipment

Power brooms, power blowers, air compressors, water flushing equipment and hand brooms shall be suitable for cleaning the surface and cracks of the old surface.

609.5.4 Auxiliary Equipment

Hand squeegees, shovels and other equipment shall be provided as necessary to perform work.

609.6 Surface Preparation

Prior to placing any asphaltic materials on the existing pavement, the Contractor shall prepare the surface to the requirements of Section 607.

609.7 Notifications

Residents, homeowners, and businesses affected by the slurry seal operations shall be notified by the Contractor between one and two days in advance of the slurry seal work. Notification shall be in writing, stating the date that the slurry seal work will begin. Suitable no parking and/or tow away signs shall also be posted prior to the slurry seal work. Should the slurry seal work not occur on the specified day, a new notification shall be distributed.

609.8 Weather Restrictions

Slurry seal shall not be applied if rain is imminent. The slurry seal surface shall not be applied if either the pavement or air temperature is fifty-five (55°) F. or below, and falling, but may be applied when both the air and pavement temperature is forty-five (45°) F. or above, and rising. The mixture should not be applied if high relative humidity prolongs the curing beyond a reasonable time. Slurry seal shall not be applied when there is danger that the slurry seal will be subjected to freezing temperatures within twenty-four (24) hours.

609.9 Application of the Slurry Surfaces

609.9.1 Fogging

When required by local conditions, the pavement surface shall be prewetted by fogging ahead of the slurry spreader box. Apply the water used in prewetting the pavement surface at such a rate that the entire surface is damp with no apparent flowing water in front of the spreader box. The rate of application of the fog spray shall be adjusted during the day to suit temperatures, surface texture, humidity, and dryness of the pavement.

609.9.2 Mixing

The slurry mixture shall be of the desired consistency upon leaving the mixer and before being deposited on the pavement surface. The total time of mixing shall not exceed three (3) minutes.

609.9.3 Spreading

The Contractor shall maintain a sufficient amount of slurry mix in all parts of the spreader box by keeping a supply against the full width of the squeegee at all times so that complete and uniform coverage of the pavement surface is obtained. Care shall be taken not to overload the spreader box. The slurry mix shall not be permitted to overflow the front sides of the spreader box. The spreader box shall be controlled and adjusted so as to prevent loss of slurry seal on varying grades and crowns.

The spreader box shall be towed at a uniform speed not to exceed five (5) miles per hour. No lumping, balling, or unmixed aggregate will be permitted in the spreader box. No segregation of the asphalt emulsion and aggregate will be permitted in the spreader box. If the coarse aggregate settles to the bottom of the mix in the spreader box, the slurry seal shall be removed from the pavement surface. No excess breaking of the emulsion will be allowed in the spreader box. The spreader box shall be kept clean and buildup of asphalt emulsion and aggregate on the spreader box will not be permitted.

609.9.4 Composition and Rate of Application of the Slurry Mix

The amount of asphalt emulsion to be blended with the aggregate shall be as determined by the laboratory report. A minimum amount of water shall be added as necessary, to obtain a fluid and homogeneous mixture. The average rate of application shall be a minimum of seventeen (17) pounds of mixture per square yard. The minimum rate of application for any 100 feet of any spreader pass shall be thirteen (13) pounds of mixture per square yard.

609.9.5 Joints and Edges

Suitable width spreading equipment shall be used to produce a minimum number of longitudinal joints. Lap longitudinal joints at the edges a minimum of four (4) inches. Longitudinal and transverse joints shall be smoothed with a squeegee if a satisfactory joint cannot be obtained by the spreader box. Feather the edges of the slurry seal with hand squeegees along gutters, shoulders, intersections, and other edges and joints. Feathering of the slurry seal at transverse ends and edges at intersections shall result in a gradual tapered edge that is barely noticeable by normal vehicular traffic and that will unlikely be snagged and damaged by snow plow blades. Feathering the edges of the slurry seal along the flange-line edges of curb and gutter or along the edges of the chip seal on a street being cape sealed shall result in a gradual sloped transition of six to nine inch width. No feathering is needed along the edge of slurry seals that extend to the curb head of streets with existing curb and gutter.

Care shall be taken to insure straight lines along gutters, shoulders, intersections, and other edges or joints.

609.9.6 Hand Work

The Contractor shall spread slurry by means of a hand squeegee in areas where the spreader box cannot be used, and in joints or cracks that are not filled by slurry. Correct areas of excessive buildup of slurry or unsightly appearance at joints and other areas using a hand squeegee. Ridges or bumps in the finished surface will not be allowed. The use of brushes or hand squeegees shall be kept to a minimum and not generally used in areas accessible to the spreader box. The finished surface in areas where hand work is performed shall result in a uniform and similar texture as that achieved by the spreader box.

609.9.7 Curing

Areas that have been slurry sealed will be allowed to cure until such time as the Engineer permits their opening to traffic.

609.9.8 Rolling

Rolling is normally not required on slurry surfaces. However, in areas of slow turning traffic, e.g. airfields, the paved surface should be rolled by a 5-ton roller with a minimum of five passes of the roller. If a pneumatic roller is used, it should be operated at a tire pressure of fifty (50) pounds per square inch.

609.9.9 Manhole and Valve Box Covers

During slurry seal application operations the Contractor shall locate, mark and protect all existing manhole and valve box covers in such a manner than they will not be covered or become stuck with the slurry seal materials and can be readily located again after the slurry seal application. Using tape prior to slurry sealing, the Contractor shall seal the seam between the rim and cover of all manholes, catch basins, and valve boxes located within the areas to be slurry sealed. If the seams were taped for a chip seal and remained taped at the request of the slurry seal Contractor, the slurry seal Contractor shall re-tape any seam areas that are not adequately sealed with tape.

After the slurry seal application is complete, the Contractor shall locate the manholes, catch basins, and valve boxes and remove their protective devices and tape. After the protective devices and tape are removed, the Contractor shall test open each manhole, catch basin, and valve box cover and, where necessary, remove any asphaltic material which may have accumulated in the lifting holes or along the frame-to-cover interface from the slurry sealing operation. When the covers are reinstalled, the Contractor shall make sure the covers do not rattle.

609.10 Measurement

Surfaces that have been slurry sealed shall be measured by the square yard of slurry seal in place and accepted. No deductions shall be made for the surface area of manholes and valve boxes within the project limits of the slurry seal work.

609.11 Payment

Payment for constructing the slurry seal surface will be made per accepted square yard of pavement surface covered by the slurry seal. The contract unit price for Furnish and Place Slurry Seal shall include all costs associated with furnishing, preparing, hauling, mixing, and applying all materials; sampling and pretesting of slurry seal mixes and components; preparing the existing surface; locating, protecting, uncovering, test opening, and cleaning manholes and valve boxes within the project limits; and for all labor, supervision, tools, equipment, materials, supplies, and incidentals necessary to complete the work.

609.12 Slurry Levelling

If slurry levelling is specified in the Contract Documents, prior to applying the slurry seal and where marked by the Engineer, the Contractor shall slurry level the existing pavement by placing sufficient slurry material at cracks and depressed areas. The type of material used for slurry leveling shall be the same as for slurry sealing. At areas to be slurry leveled the Contractor shall prepare the cracks and pavement in accordance with the requirements of Section 607 of the City's Standard Specifications prior to slurry leveling. The resulting surface shall be flush with the adjacent pavement and shall have no noticeable dips. Slurry leveling shall be done at cracks to provide a surface having no noticeable dips within a minimum of three (3) feet in width along each crack. No slurry seal shall be placed on the slurry level material until it has cured sufficiently.

Only those cracks and areas marked by the Engineer will be measured for payment. Cracks and areas slurry leveled by the Contractor that were not marked by the Engineer and were slurry leveled without prior approval of the Engineer will not be included in the quantities for payment for slurry leveling. Measurement of slurry leveling at cracks will be made per lineal foot of leveled crack and at spot-leveled areas in square yards of area actually leveled.

The unit prices for slurry leveling shall include all costs associated with furnishing, preparing, hauling, mixing, and placing all materials for the slurry leveling work.

610 - CHIP SEAL SURFACE TREATMENT (SEAL COAT)

610.1 Scope of Work

The work under this section shall consist of the surface preparation and placement of a chip seal (seal coat) on existing asphaltic concrete pavements at the locations and as specified in the bidding documents and as provided by the contract.

The Contractor shall furnish all labor, supervision, equipment, materials, supplies, tools, and incidentals for the chip seal work.

610.2 General

All chip seal coat materials and operations shall conform to Section 475 of the Wisconsin DOT Specifications (WDOT), unless otherwise noted.

All limits for chip seals will be marked by the Engineer prior to any work beginning.

If the chip seal is part of a cape seal, the edges of the chip seal work shall be six (6”) to nine (9”) inches inboard from the edges of the slurry seal part of the cape seal.

610.3 Materials

The type of chip seal (Type A or B) shall be as specified in the Contract Documents. The materials to be furnished and applied for the chip seal work shall conform to the following requirements.

610.3.1 Asphaltic Materials

The asphaltic materials shall meet the following requirements.

Type A Chip Seal - (Uncoated Chips)

The asphaltic material to be used for chip seals and for the chip seal part of the cape seals shall be anionic or cationic rapid set emulsified asphalt or MAC-5. The asphaltic material shall be compatible to the aggregate used.

Emulsified asphalt shall conform to the requirements of section 455.2.4.3 of the Wisconsin DOT Specifications.

MAC-5 asphaltic material is normally produced by blending 95% PG 58-28 asphalt cement with 5% No. 1 diesel fuel or light petroleum distillate. MAC-5 asphalt material shall conform to the following specifications when tested using applicable ASTM test methods and shall be blended at the refinery.

MAC-5 Asphalt

Absolute viscosity @ 140°F., poises	200 to 400
Flash point (COC) °F	300 min.
Distillation test:	
Distillate, % volume of total distillate	
To 500°F	5 max.
To 600°F	5 max.
Residue to 680°F, % volume	95 to 99

Test on distillation residue:

Penetration @ 77°F, 100G, 5 Sec	125 to 300
Absolute viscosity @140°F, poises	900 max
Ductility @ 77°F, 5cm/min., cm	100 min.
Solubility in TCE %	99 min.

Type B Chip Seal - (Precoated Chips)
The chips shall be precoated with asphalt cement. The precoated chips shall be placed on the emulsified asphalt specified for the Type A Chip Seal.

610.3.2 Cover Aggregate
The cover aggregate shall meet the requirements of WDOT 475.2, including the gradation specified under WDOT 475.2(2). All cover aggregate shall be washed with water to remove dust prior to being used in the chip seal work.

At least two (2) weeks prior to the start of the chip seal operations, the Contractor shall deliver to the Engineer for his approval, a sample of the uncoated chips, a fracture count test report, and a gradation test report for the aggregate proposed for the work and a sample of the precoated chips. Prior to use of the emulsion the Contractor shall also furnish to the Engineer a certificate of compliance or a test report for the proposed emulsified asphalt verifying it meets the requirements of Section 455 of the Wisconsin Standard Specifications. All tests and test reports shall be performed by a party approved by the Engineer.

610.4 Surface Preparation
Prior to placing any asphaltic materials on the existing pavement, the Contractor shall prepare the surface to the requirements of Section 607.

610.5 Construction

610.5.1 Weather Restrictions
Asphaltic material shall be applied only when air temperature is 60°F or greater and the existing surface is dry and in proper condition to receive the chip seal.

610.5.2 Spreading of Asphaltic Emulsion
The asphaltic material shall be heated to a temperature which will permit uniform spreading. The emulsion shall be applied at a rate of .30 to .40 gallons per square yard. The exact rate for each pavement shall be determined by the Contractor to provide satisfactory performance. Adjacent applications of emulsified asphalt shall close within a minimum longitudinal lap.

The length of application shall not be greater than can be covered with aggregate within ten (10) minutes of application, or longer than can be completely rolled within twenty (20) minutes of application.

610.5.3 Spreading the Aggregate

Promptly after the spreading of the asphaltic emulsion has been completed on any section of the pavement, the cover aggregate shall be spread uniformly over the treated surface by approved mechanical spreaders. The rate of application shall be sufficient to adequately cover the applied asphaltic materials with a minimum of waste.

610.5.4 Rolling

Immediately after spreading the cover aggregate, the Contractor shall roll the surface. Rolling shall be accomplished with pneumatic-tire rollers. A combination steel and pneumatic-tire roller is acceptable. Rolling shall be continued until the cover aggregate is thoroughly embedded and the surface is smooth and uniform in texture. No chip seal shall be placed without an approved roller at the site.

610.5.5 Manholes, Catch Basins, and Valve Box Covers

During chip seal operations the Contractor shall location-mark and protect all existing manholes, catch basins, and valve box covers in such a manner that they will not be covered or become stuck closed with asphaltic materials and can be readily located again. Using tape prior to chip sealing, the Contractor shall seal the seam between the rim and cover of all manholes, catch basins, and valve boxes and shall seal any holes in the covers of all sanitary manholes located within the areas to be chipped sealed.

After the chip seal operation, the Contractor shall locate the manholes, catch basins, and valve boxes, and remove their protective devices and tape. After the protective devices and tape are removed, the Contractor shall test open each manhole, catch basin, and valve box cover and, where necessary, remove any asphaltic material which may have accumulated in the lifting holes or along the frame-to-cover interface from the chip sealing operation. When the covers are reinstalled, the Contractor shall make sure the covers do not rattle.

If the chip seal is to be followed by a slurry seal within one month to form a cape seal, the tape that was applied for the chip seal to seal the seams between the rim and cover of manholes, catch basins, and valve boxes and to seal the holes in the lids of sanitary manholes may be left in place, if requested by the slurry seal contractor.

610.5.6 Removing Loose Aggregate

Within ten (10) to seventeen (17) calendar days after placement of the chip seal on any street, the Contractor shall remove and dispose of loose aggregate from that street by lightly brooming the surface with a rotary power broom and vacuum sweeping the excess stone, and shall also remove loose aggregate from driveways, sidewalks, abutting street pavements, and other areas in which the chips may have accumulated.

610.5.7 Straight Ends

In order to obtain neat and straight ends of the chip seal, the Contractor shall place paper across the existing pavement at the start and end of each chip seal in the manner specified in Section 475.3.4 of the Wisconsin D.O.T. specifications. The Contractor shall remove and dispose of such material after completing the chip seal.

610.5.8 Taping Sanitary Manholes

Prior to chipsealing, the Contractor shall tape all holes on the lids of sanitary manholes to prevent stones from entering the sanitary sewer system. The tape covering the holes shall be left in place for traffic to wear away.

610.5.9 Rolling by the City

The City may choose to perform additional rolling of the chip seal on any street after the Contractor has completed his rolling operation. The rolling by the City would utilize pneumatic-tired rolling equipment. By submitting a bid proposal for chip seal work to the City, the Contractor thereby acknowledges that such additional rolling by the City will not invalidate the Contractor's warranty on the chip seal.

610.6 Measurement

Surfaces that have been chip sealed shall be measured by the square yard of chip seal in place and accepted. No deductions shall be made for the surface area of manholes and valve boxes within the project limits of the chip seal work.

610.7 Payment

Payment for constructing the chip seal surface will be made per accepted square yard of pavement surface covered by the chip seal. The contract unit price for constructing the chip seal surface shall include all costs associated with furnishing, preparing, hauling, mixing and applying all materials; preparing the existing surface; locating, protecting, uncovering, test opening, and cleaning manholes, catch basins, and valve boxes within the project limits; rolling; removal and disposal of loose aggregate; and for all labor supervision, tools, equipment, materials, supplies and incidentals necessary to complete the work.

611 - CRACK SEALING OF ASPHALTIC CONCRETE PAVEMENTS

611.1 Scope of Work

The work under this section shall consist of the cleaning and sealing of cracks in asphaltic concrete pavement at the locations and as specified in the bidding documents and as provided by the contract.

The Contractor shall furnish all labor, supervision, equipment, materials, supplies, tools, and incidentals for the crack sealing work.

611.2 General

The Contractor shall inform the Engineer of the commencement of work at least one (1) work day prior to beginning the work.

At no time shall the Contractor place crack sealant material without the inspection of the Engineer's representative unless approved by the Engineer. If crack sealant material is found to be placed without inspection or approval of the Engineer, the quantity placed will not be accepted for payment.

The Contractor shall not crack seal any pavement areas that are to be wedged or overlayed with asphaltic concrete. If any such areas exist on the pavements to be crack sealed, then all such areas not to be crack sealed will be marked by the Engineer prior to the start of the crack sealing work.

Crack cleaning and sealing shall be done only when the ambient air and pavement surface temperatures are above 40°F. When near this minimum, additional air blasting or drying time, or both, may be necessary to assure a satisfactory bond to the cracks surfaces. Crack sealing material shall not be heated to a temperature in excess of 410°F.

Cracks shall be sealed within two (2) weeks after preparation and within fifteen (15) minutes of lancing.

Traffic lanes may be opened to traffic only after the crack sealing material has set sufficiently so it will not be picked up under traffic. Powder may be applied to the crack sealing material, but only after the material surface has set so as to avoid penetration of the powder into the material.

611.3 Materials

The crack sealant material shall be a rubberized material which is compatible with both chip seal materials and slurry seal materials, either of which may be used in the future on the pavement being crack sealed. The crack sealant material shall also conform to the requirements of ASTM D3405-78, Standard

Specifications for Joint Sealants, Hot Poured, for Concrete and Asphalt Pavements. A hot-pour crack sealant shall be used. Prior to any work beginning on the project, the Contractor shall submit to the Engineer a manufacturer's certificate stating that the crack sealant material complies with the above requirements.

Future chip seal work will use anionic or cationic emulsified asphalt conforming to the requirements of Section 610.3.1. Future slurry seal work will use cationic emulsified asphalt conforming to the requirements of Section 609.4.1.

611.4 Equipment

Routing or sawing equipment shall be mechanical and power driven, capable of cutting the cracks to the required dimensions. Equipment designed to "plow" the cracks to dimension will not be permitted.

Air compressors shall provide moisture and oil-free compressed air and shall be of sufficient size to blow sand and other foreign material from the crack prior to placing the crack sealant materials.

High temperature (2700° avg.) and high air velocity (1900 FPS avg.) crack blowing equipment shall be used to do final crack blowing and lancing.

Equipment used for heating and placing the premixed material shall be of the oil-jacketed, double-boiler type, capable of heating the material to 400°F and pumping the material into the prepared cracks.

A narrow shaped squeegee, doughnut dish, or similar device approved by the Engineer, shall be used to aid in the placement of the crack sealant material.

611.5 Construction

611.5.1 General

For purposes of defining whether a specific asphaltic concrete pavement is to have its cracks routed or sawed or not, the pavements are classified as being either Division 1 or Division 2 pavements and such Divisions are described below.

1. Division 1 Pavements
   The pavements classified as Division 1 Pavements are those asphaltic concrete pavements that are to have their cracks prepared by routing or sawing. These pavements generally are those that will not be slurry sealed or chip sealed within one year of crack sealing.

2. Division 2 Pavements
   The pavements classified as Division 2 Pavements are those asphaltic concrete pavements that are not to have routing or sawing of their cracks. These pavements generally are those pavements that will be slurry sealed or chip sealed within one year of crack sealing.

611.5.2 Routing or Sawing

The following requirements for crack preparation shall be met by the Contractor on asphaltic concrete pavements that are to have routing or sawing of its cracks.

1. Class I Cracks: Cracks which have an average opening of one-half (1/2) inch or less shall be routed or sawed to provide a minimum filler material reservoir of one-half (1/2) inch in width by a nominal three-quarter (3/4) inch depth.

2. Class II Cracks: Cracks which have an average opening greater than one-half (1/2) inch shall be routed or sawed to provide a filler material reservoir of three-quarter (3/4) inch in width by three-quarter (3/4) inch depth.

3. Maximum Routing and Sawing Dimensions:
   Cracks shall not be routed or sawed to more than a three-quarter (3/4) inch width by a three-quarter (3/4) inch depth unless approved by the Engineer. Cracks with an average opening greater than three-quarter (3/4) inch wide and three-quarter (3/4) inch deep are not required to be routed or sawed.

If the crack sealing operation will not immediately follow the crack preparation work, all debris shall be removed from the affected travel lanes immediately after the crack preparation work is completed on a roadway, and the lanes shall be opened to traffic. Debris may be moved to the edges of the roadway.

611.5.3 Crack Cleaning

All cracks that are to be crack sealed shall be blown clean of all vegetation and debris prior to the sealing of the cracks. All such cracks shall be clean and dry prior to being sealed.

Immediately prior to sealing, all cracks shall be lanced with high temperature - high velocity blowing equipment to remove moisture from the crack.

611.5.4 Sealing of Cracks

The entire crack reservoir shall be filled to a level even with the roadway surface. Crack sealant material above the pavement surface or on the pavement surface in excess of one-half (1/2") inch from the edges of the crack will not be allowed.

All cracks in excess of one-quarter (1/4") inch in width shall be crack sealed. Cracks of widths equal to or less than one-quarter (1/4") inch are not to be crack sealed.

Areas where alligator cracks in the pavement exist are not to be crack sealed. The Contractor may propose an alternate method of filling the areas of alligator cracks. The use of any such alternate method shall be subject to the approval of the Engineer.

Unless specified in the Contract Documents, the longitudinal crack located at the interface of the asphaltic concrete pavement and curb and gutter flange is not to be crack sealed and need not be cleaned out.

After sealing the cracks the Contractor shall furnish and place paper, sand, or other de-tackifier materials onto the surface of the sealant so that the street can be open to traffic within two (2) hours of the sealant placement.

611.5.5 Debris Removal

Asphaltic concrete and debris from the routing, sawing, crack preparation, and crack sealing work shall be removed from the pavement surface by brooming, blowing with compressed air, or other methods satisfactory to the Engineer. Unless specified otherwise in the Contract Documents, the Contractor shall leave the debris along the edges of the pavement, and the City will remove the debris.

611.6 Measurement

The Contractor shall stockpile all crack sealant materials at a storage facility designated by the City. At least twenty-four (24) hours prior to delivery, the Contractor shall inform the Engineer of the time and date of delivery. The Contractor shall stack the blocks neatly to facilitate ease of tabulation and inspection by the Engineer. Blocks shall be taken only out of this stock pile for use on the work. The stockpiling and use of materials will be monitored by the Engineer and are subject to the approval by the Engineer.

The measurement of crack sealant materials will be made per pound of crack sealant material furnished from the stock pile and placed on the streets.

611.7 Payment

Payment for furnishing and placing the crack sealant material will be made per pound of crack sealant material furnished from the stock pile and acceptably placed on the specified streets. All costs for routing, sawing, crack cleaning, lancing, crack sealing, and sweeping; for furnishing manufacturer's certificates; and for all labor, supervision, materials, equipment, supplies, tools, and incidentals necessary to complete the crack sealing work shall be included in the contract unit price for Furnish and Place Crack Sealing Material or Route and Furnish and Place Crack Sealing Material.

612 - CAPE SEAL SURFACE TREATMENT

612.1 Description

A cape seal is a multiple surface treatment consisting of a chip seal followed by an application of slurry seal.

612.2 Scope of Work

The work under this section shall consist of the surface preparation and placement of a cape seal on existing asphaltic concrete pavements at the locations and as specified in the bidding documents and as provided by the contract.

612.3 General

All limits for cape seals will be marked by the Engineer prior to any work beginning.

612.4 Chip Seal Work

The materials for and the construction of the chip seal shall conform to the requirements of Section 610 for a Type A chip seal using uncoated chips.

The edges of the chip seal work shall be six (6”) to nine (9”) inches inboard from the edges of the slurry seal.

612.5 Removing Loose Aggregate

During the time period of one (1) to five (5) days prior to placing the slurry seal portion of the cape seal on any street, the Contractor shall remove and dispose of loose aggregate from that street by lightly brooming the surface with a rotary power broom and vacuum sweeping the excess stone, and shall also remove loose aggregate from driveways, sidewalks, abutting street pavements, and other areas in which the chips may have accumulated.

612.6 Slurry Seal Work

The materials for and the construction of the slurry seal shall conform to the requirements of Section 609, except for the rate of application. The average rate of application shall be a minimum of twenty-one (21) pounds of mixture per square yard. The minimum rate of application for any 100 feet of any spreader pass shall be seventeen (17) pounds of mixture per square yard.

The asphaltic emulsion shall be compatible with the aggregate used in the slurry seal mix and the aggregate placed in the chip seal.

At the Contractor's option, boiler slag may be added to the slurry mixture but at a rate not to exceed sixty-five (65%) percent nor less than thirty (30%) percent of the aggregate mixture by weight.

The Contractor shall feather the slurry seal between the edge of the chip seal and the edge of the slurry seal.

612.7 Measurement

Surfaces that have been cape sealed shall be measured by the square yard of cape seal placed and accepted. No deductions shall be made for the surface area of manholes, catch basins, and valve boxes within the project limits of the cape seal work. The width of the cape seal shall be to the edges of the slurry seal work.

612.8 Payment

Payment for constructing the cape seal surface will be made per accepted square yard of pavement surface covered by the cape seal. The contract unit price for constructing the cape seal surface shall include all costs associated with furnishing, preparing, hauling, storing, mixing, and applying all materials; sampling and pretesting of cape seal mixes and components; preparing the existing surface; locating, protecting, uncovering, test opening, and cleaning manholes, catch basins, and valve boxes within the project limits; and for all labor, supervision, tools, equipment, materials, supplies, and incidentals necessary to complete the work.

- END OF SECTION 600 -