

SECTION 600

ASPHALTIC CONCRETE CONSTRUCTION

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
CITY OF MANITOWOC, WISCONSIN

SECTION 600

ASPHALTIC CONCRETE CONSTRUCTION

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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, in conformance with the Asphaltic Institute Standards (where applicable) 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 sealcoats such as 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 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". When a conflict occurs between standards, the more restrictive shall apply.

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 asphaltic cement or 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. Authorized signature of the supplier of the asphaltic concrete.
10. % of air voids

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 two (2) sample containers. The Engineer will mark the identity of all samples, test one sample and keep one sample for testing if the first sample fails the test. 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.

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, overlaid, or will receive a new asphaltic concrete reconstruction 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 completed 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 or that the Engineer specifically requests to be included.

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.

602 - DESCRIPTION OF ASPHALTIC CONCRETE MIXES

Unless otherwise specified in the Contract Documents, the asphaltic concrete mixes shall conform to the requirements of WDOT 460 for Type E asphaltic concrete pavement and to the following requirements:

Table 460-1 Aggregate Gradation Master Range and VMA Requirements

PERCENTS PASSING DESIGNATED SIEVES							
NOMINAL SIZE							
SIEVE SIZE	37.5 mm	25.0 mm	19.0mm	12.5 mm	9.5 mm	SMA 12.5mm	SMA 9.5 mm
50.0 mm	100						
37.5 mm	90-100	100					
25.0 mm	90 max	90-100	100				
19.0 mm	---	90 max	90-100	100		100	
12.5 mm	---	---	90 max	90-100	100	90-97	100
9.5 mm	---	---	---	90 max	90-100	58-72	90-100
4.75 mm	---	---	---	---	90 max	25-35	35-45
2.36 mm	15-41	19-45	23-49	28-58	20-65	15-25	18-28
75 mm	0-6.0	1.0-7.0	2.0-8.0	2.0-10.0	2.0-10.0	8.0-12.0	10.0-14.0
Percent Minimum VMA	11.0	12.0	13.0	14.0	15.0	15.5	16.5

WAPA Design Guide Update

Traffic Class	Design Daily ESAL *** Range	Old Specs	Superpave Type	Typical Examples of Use
I	<1	LV LV LV LV	E-0.3 E-0.3 E-0.3 E-0.3	<ul style="list-style-type: none"> • Residential driveways • Parking lots, 50 stalls or less • School areas and playfields • Seasonal recreational roads
II	1-5	LV LV	E-0.3 E-0.3	<ul style="list-style-type: none"> • Parking lots, more than 50 stalls • Residential streets and low volume rural roadways
III	6-50	MV MV	E-1 E-1	<ul style="list-style-type: none"> • Collector streets and other roadways • Light industrial lots
IV	51-275*	MV MV MV	E-3 E-3 E-3	<ul style="list-style-type: none"> • Local Business Streets • Major arterial streets • Medium industrial streets/lots
V	276-1000**	HV HV	E-10 E-10	<ul style="list-style-type: none"> • Heavy truck terminals/truck stops • Heavy industrial drives/lots • Bus stops

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.

603.2

Nonconforming Mixes

If the test results of the samples tested by the Engineer under Section 601.4 are outside the acceptable JMF control limits, 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 backup sample retained by the Engineer shall be tested. The test values for the backup sample 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 acceptable to the Engineer, the asphaltic concrete shall be considered satisfactory.
4. If the test values of the Averaged Sample are not acceptable, 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.
5. If the Final Averaged Sample of the 4 test values are unacceptable, 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 fifty (50%) percent of the contract unit price for the asphaltic concrete.
6. 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.
7. 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.

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 rain or cool weather (<65°F), the loads shall be covered with a suitable material to protect them from excessive cooling. No load must 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 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 maximum deviation from the true cross-section shall be ± 0.2 feet. Deviations more than ± 0.2 feet that continue along the roadway without correction shall not be allowed.

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. Deviations of the final rolled and compacted base shall not exceed ± 0.1 foot.

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

A tack coat shall be applied prior to the placement of all lifts of asphaltic concrete placed on existing paved surfaces. 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.

The Contractor shall be responsible for even application of the tack coat. Tack coat shall not be accepted if the application is streamed or unevenly distributed due to clogged nozzles or improper functioning nozzles.

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. 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

<u>Surface Being Coated</u>	<u>Application Rate (gal./sq. yd.)</u>
Concrete Pavement	0.025
Asphaltic Concrete Pavement	0.05
Brick Pavement	0.10

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 curbs, 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 not be less than 40° F.

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 judgement of the Engineer, been adversely affected thereby,

shall be removed and replaced at the Contractor's expense.

605.4.2 Spreading

A mechanical asphalt mixture paving machine conforming to WDOT 405.3.1.4 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 depth of separate leveling, binder or surface courses shall not exceed two and one-half (2 1/2") inches in compacted thickness unless otherwise specified by the Engineer. The compacted surface course shall have a minimum thickness of one and one-quarter (1 1/4") inches, unless otherwise provided on the plans.

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 offset at least six (6") inches, and transverse joints shall be offset at least two (2') feet. All joints shall be tapered and no joints shall be vertical.

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 and the material has been cooled to sufficiently support traffic.

605.5 Compaction

605.5.1 General

Compaction of asphaltic concrete pavement shall conform to the requirements of WDOT 450.3.2.6 and WDOT 460.3.3, using the Specified 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 WDOT 460.3.3.

605.5.3 Compaction Testing

The Contractor shall supply a Nuclear Test Meter and shall perform testing as follows:

- One test series at the beginning of operations each day, and
- One test series for every 1,000 lane feet.

A minimum of two series of tests shall be required for each day of paving.

A test series is comprised of two density readings. If both test results exceed the required density, no more tests need to be taken for that series. If either of the tests do not exceed the required density, a third test shall be taken.

The density of the asphaltic pavement shall meet or exceed those values listed in WDOT 450.3.2.6 and 460.3.3.

The City shall have an inspector in attendance at all times during the nuclear density testing.

All costs for the nuclear density testing shall be included in the unit price bid per ton of Asphaltic Concrete Pavement.

605.6 Measurement and Payment

Measurement and payment for construction of asphaltic concrete pavement will be made per ton of asphalt and paved surfaces shall meet the specifications for the pavement thickness 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; furnishing, preparing, hauling, mixing, and placing of all materials; for compacting all mixtures; for supplying nuclear meter testing equipment and labor; 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 particular 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 each location 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 subbase materials, recompact the subbase, and replace the pavement with new asphaltic concrete pavement. The asphaltic concrete thickness and number of lifts are given below for patches in the various thicknesses of existing pavement.

1. Patches in 6" Pavement
Sawcut, remove and replace existing pavement with six (6) inches of asphaltic concrete. The material is to be placed in at least three lifts with the maximum compacted lift thickness being 2½ inches.
2. Patches in 5" Pavement
Sawcut, remove and replace existing pavement with five (5) inches of asphaltic concrete. The material is to be placed in at least two lifts with the maximum compacted lift thickness being 2½ inches.
3. Patches in 4" Pavement
Sawcut, remove and replace existing pavement with four (4) inches of asphaltic concrete. The material shall be placed in at least two lifts, with the maximum compacted lift thickness being 2½ inches.
4. Patches in 3" Pavement
Sawcut, remove and replace existing pavement with three (3) inches of asphaltic concrete. The material shall be placed in at least two lifts, with the maximum compacted lift thickness being 1½ inches.

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

as specified above for the particular 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. 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 Sub-base

At areas to be full depth patched, the Contractor shall remove and dispose of any unsuitable existing sub-base materials and shall replace such removed materials with materials of type equivalent to or better than the surrounding roadway sub-base materials. The suitability of the existing sub-base materials and of the replacement materials shall be subject to the approval of the Engineer. The Contractor shall add sufficient sub-base materials to restore the sub-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 or properly barricaded in conformance with the MUTCD.

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 sub-base and the asphaltic concrete to conform to the requirements of Section 305 for the sub-base 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 yard 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 yard 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; hauling and properly disposing of removed pavement and subbase materials off site; furnishing, placing, and compacting subbase

materials and temporary surfacing; furnishing, preparing, hauling, 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.

606.3 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 thickness, 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 yard of pavement area patched for the various thickness of patches.

606.3.3 Payment

Payment for partial depth patching of asphaltic concrete pavement shall be made per square yard of accepted pavement area patched for the thickness of the patch.

The contract unit prices for the appropriate thickness of partial depth patching shall include all costs for; 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.

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 particular 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 460.3.3.

606.5 Crackfilling Before Resurfacing

606.5.1 General

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

Unless otherwise specified in the Contract Documents, all crack filling work shall conform to the requirements of Section 611, and routing or sawing of the cracks will be required.

606.5.2 Measurement and Payment

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

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.

The City reserves the right to keep some or all of the millings and require the Contractor to haul them to a predetermined site within the City. Millings shall otherwise 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.

Fabric joints shall have an overlap of a minimum of 6" at all overlap locations or as specified by the manufacturer.

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 paving fabric 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 FOR RESURFACING

On pavements that are to be resurfaced with asphaltic materials by overlaying, wedging, chip sealing (seal coating), slurry sealing, or other method, the Contractor shall prepare the surface in accordance with the following requirements.

Immediately prior to applying the asphaltic materials, the Contractor shall thoroughly clean the existing 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.

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

All costs associated with the surface preparation shall be included in the unit prices for the pavement resurfacing 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 overlaid unless specifically authorized by the Engineer. Pavement repairs shall be made in accordance with Section 606.

In addition and prior to overlaying, the Contractor shall adjust all manhole and shall either adjust or coordinate adjustments with the Manitowoc Public Utilities for all valve box extensions located within the area to be overlaid 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.

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 ton basis unless otherwise specified in the Contract Documents.

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; 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 specific lot of asphaltic concrete overlay is less than the specified minimum, the City may make payment at an adjusted price.

609 - SLURRY SEAL RESURFACING

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 C386

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.

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.

609.2.1 Cont...

Alternate No. 1

Alternate No. 2

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
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 Federal Specifications for Asphalt Emulsions
for Asphalt SS-A-674b 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 SS1H slow-setting emulsified asphalt conforming to the requirements of ASTM Specification D-977. 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 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, the aggregate blend shall have a sand equivalent of not less than 45 (minimum 45 recommended). When tested according to AASHTO (AASHTO T104-57 or ASTM C88-63) the aggregate shall show a loss of not more than 10%. When testing according to AASHTO T-96-60 or ASTM C131-64T the aggregate shall show a loss of not more than 30%.

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 D242-64. Mineral fillers shall only be used if needed to improve the workability of the mix or gradation of the aggregate.

The combined mineral aggregate shall conform to the following gradation when tested by ASTM D242-64.

<u>Sieve Size</u>	<u>Percent Passing</u>
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

This aggregate blend is used when it is desired to fill surface voids, correct severe surface conditions, and provide sealing and a minimum wearing surface. An approximate application rate of 10 to 15 pounds per square yard based on dry aggregate weight is used when standard aggregates are utilized. A typical example of this type of slurry surface would be on pavements with medium textured surfaces, which would require this size of aggregate to fill in the cracks and provide a minimum wearing surface. Another example would be placing a general slurry on flexible base, stabilized base, or soil cement as a sealer prior to final paving.

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 thirty (30%) percent of the mixture by weight. No metal pieces shall be contained within the slag greater than 1/8".

609.4.4 Water

All water used with the slurry mixture shall be potable and free from harmful soluble salts. The Contractor shall be responsible for all costs to furnish the water. The Contractor shall contact the Manitowoc Public Utilities regarding costs for obtaining water from their hydrants. The Contractor shall be responsible for obtaining all necessary permits and paying all permit fees.

609.4.5 Sampling and Laboratory Testing

Sources of all slurry seal materials shall be selected prior to the time the materials are required for use in the work. All materials shall be pretested in a qualified laboratory as to their suitability for use in the slurry mix. The theoretical asphalt content shall be determined in the laboratory. The laboratory shall also determine if a mineral filler is required, and if so, how much should be used. Test samples shall be made and tested on a Wet Track Abrasion Machine. A complete laboratory analysis and test report accompanied by abraded and unabraded slurry test samples shall be submitted to the Engineer prior to any slurry seal work beginning.

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.

609.4.6 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.

609.4.7 Storage

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

- 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 fifteen days before the work starts.
- 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, preceding spreading equipment with a maximum application of 0.05 gallons per square yard.
Sufficient machine storage capacity to mix properly and apply a minimum of five tons 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 Composition and Rate of Application of the Slurry Mix
The amount of asphalt emulsion to be blended with the aggregate shall be that as

determined by the laboratory report. A minimum amount of water shall be added as necessary, to obtain a fluid and homogeneous mixture. The rate of application shall be a minimum of thirteen (13) pounds of dry aggregate per square yard.

609.8 Weather Restrictions

The slurry seal surface shall not be applied if either the pavement or air temperature is 55° F. or below, and falling, but may be applied when both the air and pavement temperature is 45°F. or above, and rising. The mixture should not be applied if high relative humidity prolongs the curing beyond a reasonable time. The Slurry Seal shall not be placed during rain, immediately prior to or after rain. The asphalt surface shall be free of puddles prior to work restarting.

609.9 Application of the Slurry Surfaces

609.9.1 General

The surface shall be fogged with water directly preceding the spreader. The slurry mixture shall be of the desired consistency when deposited on the surface, and no additional elements shall be added. The total time of mixing shall not exceed four minutes. A sufficient amount of slurry shall be carried in all parts of the spreader at all times, so that complete coverage is obtained. No excessive breaking of the emulsion will be allowed in the spreader box. No streaks, such as caused by oversized aggregate, are to be left in the finished pavement.

609.9.2 Joints

No excessive build-up nor unsightly appearance shall be permitted on longitudinal or transverse joints.

609.9.3 Hand Work

Approved squeegees shall be used to spread slurry in areas that are not accessible to the slurry mixer. Care shall be exercised in leaving no unsightly appearance from hand work.

609.9.4 Curing

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

609.9.5 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.

609.9.6 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 that they will not be covered or become stuck with the slurry seal materials and can be readily located again after the slurry seal application. After the slurry seal application is complete, the Contractor shall locate the manholes and valve boxes and remove their protective devices. After the protective devices are removed, the Contractor shall test open each manhole 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. The Contractor and the City Inspector shall measure the final slurry sealed areas together so that there are no discrepancies as to the final quantity.

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 constructing the slurry seal surface 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.

610 - CHIP SEAL RESURFACING (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 408 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.

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)

Anionic or cationic rapid set Emulsified Asphalt conforming to the requirements of the Specification for Emulsified Asphalt, AASHTO Designation M140 or M208. The emulsified asphalt shall be compatible to the aggregate used.

Type B Chip Seal - (Precoated Chips)

The chips shall be precoated with 0.9% (minimum) of 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 401.2., including the gradation specified under WDOT 401.2.7.

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 roadbed, 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 Manhole and Valve Box Covers
During chip seal operations the Contractor shall location-mark and protect all existing manhole and valve box covers in such a manner that they will not be covered or become stuck with asphaltic materials and can be readily located again. After the chip seal operation, the Contractor shall locate the manholes and valve boxes, and remove their protective devices. After the protective devices are removed, the Contractor shall test open each manhole 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.
- 610.5.6 Removing Loose Aggregate
Within ten (10) to seventeen (17) days after placement of the chip seal on any street, the Contractor shall remove 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.
- 610.6 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 and valve boxes within the project limits; rolling; removal of loose aggregate; and for all labor supervision, tools, equipment, materials, supplies and incidentals necessary to complete the work.

611 - CRACK FILLING OF ASPHALTIC CONCRETE PAVEMENTS

611.1 Scope of Work

The work under this section shall consist of the cleaning and filling 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 filling 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 fill material without the inspection of the Engineer's representative unless approved by the Engineer. If crack fill 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 crackfill any pavement areas that are to be wedged or overlaid with asphaltic concrete. If any such areas exist on the pavements to be crackfilled, then all such areas not to be crackfilled will be marked by the Engineer prior to the start of the crackfilling work.

Crack cleaning and filling 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 fill material shall not be heated to a temperature in excess of 410°F.

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

Traffic lanes may be opened to traffic only after the crack fill material has set sufficiently so it will not be picked up under traffic. Powder may be applied to the crack fill 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 filling 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 crackfilled. The crack filling 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 filler 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 filling material complies with the above requirements.

Future chip seal work will use HFRS2 emulsified asphalt conforming to the

requirements of the Specifications for Emulsified Asphalt, AASHTO Designation M140 or M208. Future slurry seal work will use Type SS-1H slow setting emulsified asphalt conforming to the requirements of ASTM Specification D-977.

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 fill materials.

High temperature (2700 FPS 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 "Y" shaped squeegee shall be used to aid in the placement of the crack fill 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 crackfilling.

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 crackfilling.

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 filling 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 filled shall be blown clean of all vegetation and debris prior to the filling of the cracks. All such cracks shall be clean and dry prior to being filled.

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

611.5.4 Filling of Cracks

The entire crack reservoir shall be filled to a level even with the roadway surface. Crack fill 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 crackfilled. Cracks of widths equal to or less than one-quarter (1/4") inch are not to be crackfilled.

Areas where alligator cracks in the pavement exist are not to be crackfilled. 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 crackfilled and need not be cleaned out.

611.5.5 Debris Removal

Asphaltic concrete and debris from the routing, sawing, crack preparation, and crackfilling 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 fill 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 crackfilling materials will be made per pound of crack fill material furnished from the stock pile and placed on the streets.

611.7 Payment

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

- END OF SECTION 600 -

SECTION 600

ASPHALTIC CONCRETE CONSTRUCTION

Details

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

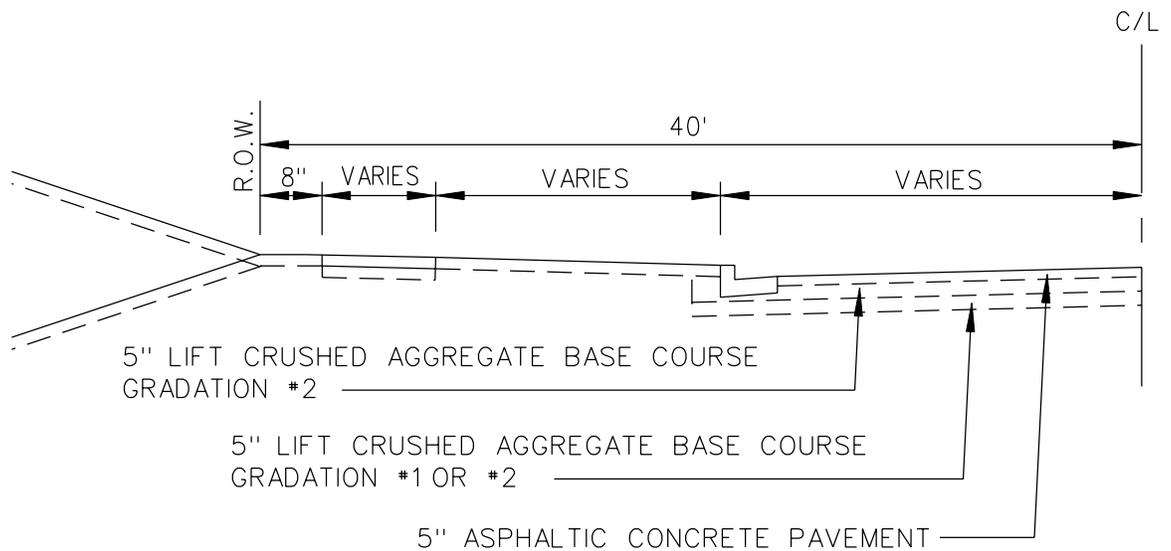
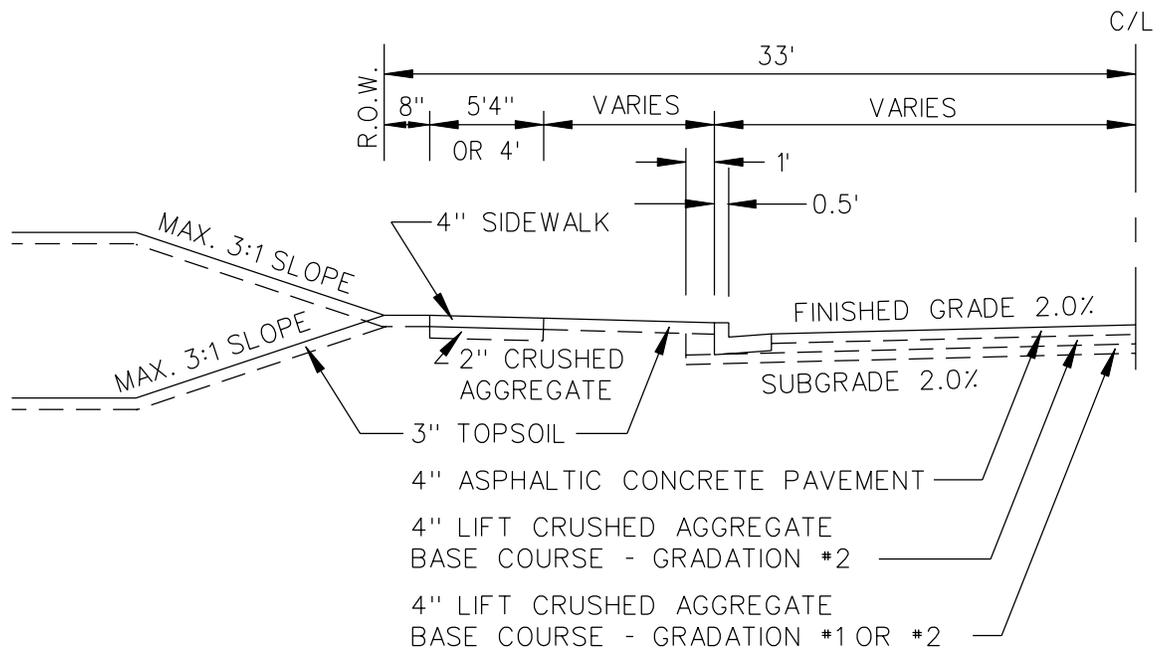
CITY OF MANITOWOC, WISCONSIN

SECTION 600

ASPHALTIC CONCRETE CONSTRUCTION

DETAILS

<u>Detail Number</u>	<u>Title</u>
601	Standard Typical Asphalt Section - 66' and 80' R.O.W.



NOTES:

- 1.) ALL INFORMATION SHOWN ON THE UPPER SECTION IS TYPICAL FOR THE LOWER SECTION EXCEPT WHERE NOTED.
- 2.) THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1/3 INCH ABOVE THE TOP OF THE CURB FOR EACH FOOT OF DISTANCE FROM THE FACE OF THE CURB.

NO SCALE

TYPICAL
 ASPHALT ROADWAY SECTIONS
 FOR 66' & 80' ROW



City of Manitowoc
 ENGINEERING DEPARTMENT

Rev. 4/05

FORM NO.
 601