SECTION 400

PAVEMENTS

BITUMINOUS PAVEMENTS

401-1 GENERAL

This work is to be accomplished with adherence to the latest revision of the Section 401 Supplemental or Special Provision, and Section 106 - Quality.

References:

(1) AASHTO Highway Materials-Part I and Part II

(2) Standard Specifications

Section 108 - Payment
Section 305 - Premixed Bituminous Base
Section 307 - Full-Depth Recycled Pavement
Section 310 - Bituminous Stabilized Base
Section 403 - Hot Bituminous Pavement
Section 409 - Bituminous Tack Coat
Section 425 - Recycled Bituminous Pavement
Section 608 - Sidewalks
Section 609 - Curbing
Section 612 - Bituminous Hand Sealing
Section 627 - Pavement Markings
Section 639 - Engineering Facilities
Section 652 - Maintenance of Traffic
Section 700 - Materials
Section 702 - Bituminous Materials
Section 703 - Aggregates

(3) Special Provisions

(4) Supplemental Specifications

(5) Standard Detail Sheets

(6) Special Detail Sheets

(7) Project Plans - Typical Sections

Hot Mix Asphalt Pavements (Bituminous concrete or "Hot top") may be used as a base course, leveling course, binder course, surface course, or resurface course placed upon any type of prepared surface.

Mix types, pavement thickness, and number of lifts in each course may either be given in a Special Provision, Contract Proposal book, or on the plans along with any recent Specification changes (Supplemental Specifications), additions, or special requirements applying to each particular project.

401-2 LAYOUT AND CONTROL

Centerline layout and control will be determined by the level of treatment (scope) decided on for the project. The Department is responsible for locating the project limits, and providing minimal stationing control every 500 meters [1000 ft]. The level of layout and control will vary from full survey control that will be provided by the Department (normally using the services of a survey crew to provide centerline or some other reference line), the running of centerline by the Contractor with offset stakes if an accurate set of stakes is available, or by the splitting of the existing pavement by the Contractor for centerline control. It is recommended that the line used for control be checked for accuracy before its use.

On projects requiring shimming to improve rideability; correct settlements; modify crown, superelevation or cross-slope; improve drainage in flat areas or any other necessary adjustments; "mark-up" grades may be determined from levels, stringlines, straightedges, markups and Shim Quantity Reports taken by ARAN, or other accurate means of setting accurate relative grades. These grades are usually marked on the pavement with pavement-marking paint, or preferably on side stakes with the required grade or cross-slope that is required, so that the grades are clearly visible to the paving crew while paving.

401-3 TESTING REQUIREMENTS

a. GENERAL REQUIREMENTS

All Hot Bituminous Pavements produced for use on the Department's projects will be subject to Quality Control/Quality Assurance and evaluated using random statistical analysis as outlined in the most recent revision of Section 401 - Hot Mix Asphalt Pavements, and Section 106 - Quality.

The Following is a list of checks and certifications required prior to the use or placement of Hot Mix Asphalt Pavements on Department projects:

Plant Certification: Checked by QA staff for minimum production equipment and stockpiles

QC Lab Check: Checked by QA staff for minimum testing equipment

Job Mix Formula: One (1) per mix per year, approved by the Department's Central Testing Lab. Layover Mix designs are permitted, though they should be confirmed by the Lab.

Gradation & Asphalt Content: See latest revision of Section 401 and 106

Compaction (Density): Wearing Course: See latest revision of Section 401 and 106

Deleterious Material & Absorption: See latest revision of Section 401 and 106

Elongation & Fractured Stone: See latest revision of Section 401 and 106

Bituminous Material: For perfomance-graded binder, the supplier shall furnish a Quality Control Plan and Certificate of Analysis to the Testing Engineer. They will be kept on file at the Bangor Testing Lab. With each shipment of material, a Loading Invoice and Statement of Certification (both from supplier) shall be furnished to the Resident Engineer/Inspector on the project.

b. HOT MIX ASPHALT SAMPLING

All testing will be conducted under Quality Control, Quality Assurance. (Section 106-Quality)

The Hot Mix Asphalt Pavement producer is responsible for controlling the production quality of the HMA at the hot mix plant in accordance with their Quality Control plan and the minimum Quality Control requirements outlined in Section 401-Hot Mix Asphalt Pavements, and Section 106 - Quality.

The paving contractor or subcontractor is responsible for controlling the delivery, laydown, compaction, and finishing quality of the HMA pavements in accordance with their Quality Control Plan, and the minimum Quality Control requirements outlined in Section 401- Hot Mix Asphalt Pavements, and Section 106 - Quality.

The Department is responsible for the random Quality Assurance mix sampling of HMA material prior to its final disposition, such as in the haul truck, the paver, or the transfer machine hopper. Random Quality Assurance samples (cores) for density will be cut from the roadway at predetermined random locations after the finishing operation is complete, and the HMA has cooled sufficiently to allow the cutting of a core without damaging it. The use of ice to cool the mat is suggested.

All sampling will utilize random statistical analysis procedures, and will follow the Departments methods defined in the Section 401 - Hot Mix Asphalt Pavement, Section 106 - Quality, and the MDOT/ACM joint Testing Policy and Procedure Manual.

The Street Inspector should observe the cutting and removal of the cores by the Contractor. The cores and mix sample boxes are the sole property of the Department, and are to remain in the possession of the Department's representative until the samples can be secured in a core transport container or mix sample box and secured with a DOT approved locking device, to be transported to the acceptance lab.

After the cores have been cut, the Inspector will check them for damage, measure each core and record the thickness on the sample identification tag. The cores then should be examined for adherence of unrepresentative layers of gravel or previously placed bituminous layers. If unrepresentative layers are present, the core should be marked with marking paint pen or crayon to be trimmed at the testing lab. Cores not marked at the time of sampling will not be trimmed by the testing lab. If the Contractor has an acceptable pavement trim saw on the project site, and the Inspector agrees, the Contractor may be allowed to trim only the unrepresentative layer from the core sample. When the sample is to be transported to the testing lab, or even on-project, the core sample should be placed directly into the core transport container, with two copies of the sample identification tag for that sample placed either beneath, or wrapped around, the core sample for easy sample identification at the testing lab. If the core sample is to leave the possession of the Department's representative, the core transport container must be sealed and locked with the approved locking device. If damage is apparent on the core sample, and the Contractors QC representative agrees, the core should be recut in accordance with the current policy for core resampling.

Cores should be identified using an easily tracked method. Sample identification number, or simple core number should be marked on surface of the core.

A copy of all sample identification tags documenting core information -- location, mixture, and thickness, will be sent with the cores to the Acceptance Lab for density testing. The Resident and/or Inspector will be responsible for seeing that cores cut that day are delivered to the plant for testing as soon as possible. (Refer to most recent Section 401 - Hot Mix Asphalt Pavement)

The Acceptance Lab will report the results of the density tests to the Resident as soon as possible. This is typically done through electronic means, such as E-mail, or in certain cases, fax. In the event electronic delivery is not possible, arrangements should be made for mail delivery.

It should be called to the attention of all concerned that considerable importance is placed on obtaining the required densities. As a result, after initial densities are checked and found acceptable, no one should relax the inspection or construction procedures. Procedures employed by the Contractor to achieve density that result in the damage of the HMA mat integrity, cause displacement, or cause the HMA aggregate be crushed shall be discontinued, and the damaged HMA mixture removed and replaced at no additional cost to the Department.

When failing densities occur on cores, any corrective action that is taken in regard to future work must be noted on the Street Inspector's daily report. Corrective action will most usually take the form of changing the roller pattern to increase the number of passes over the mix.
Corrective action that is more involved than the increase in roller passes or type of rollers would normally involve an amendment to the Contractors QC plan.

401-4 CONSTRUCTION

a. Pre-paving Conference

Before the placement of HMA pavements starts on the project, a Pre-paving conference is scheduled with all parties involved in the project.

(1) General

To properly coordinate Construction and Paving activities, a Pre-paving Conference will be held prior to paving operations. At that time, a full discussion of any and all paving problems should take place. The procedure is to be as follows:

(a) The Resident will notify the area Project Manager two weeks prior to the anticipated paving date.

(b) The Project Manager and the Quality Assurance Supervisor will set a time for the conference, to take place at the project or other designated site.

(c) It will be the responsibility of the Resident and Project Manager to see that representatives from the Prime Contractor, the Paving Contractor, and other involved personnel of the Department are invited to attend.

(d) The Quality Assurance Supervisor will instruct the area QA Inspector who will be assigned to the project to attend the Pre-Paving meeting, if available. The Project Manager and the Resident will be responsible for instructing the Street Inspector to attend the Pre-Paving meeting, and for obtaining a ticket-taker for the paving operation.

The meeting will be documented by the Department in the form of a memo to be retained in the Project Files. The importance of this Pre-Paving Conference cannot be over-emphasized. The utmost in cooperation is necessary in order to obtain the desired goal of a smooth, durable and skid-resistant riding surface. The discussion should cover all phases of the paving operation, testing requirements, and project-specific concerns of all parties regarding the paving operation.

(2) Site Examination

Before the Pre-Paving Conference, the Street Supervisor, Street Inspector, and Resident should go over the project together, observing the condition of the base, checking special areas to be paved, noting special drainage areas, and any other areas needing special attention.

The Resident should have a set of plans, and a copy of the Bid Book for the Street Inspector's use. While going over the project, the Resident can advise the Inspector on what changes have been made in the plans. The Inspector should be acquainted with the typical sections, super-elevated curves, paved widenings, driveways, gutters, and other details related to paving which are shown on the plans. They must also be aware of any general policy changes or Project changes that affect this phase of the work.

(3) Additional Items

The following additional items will be covered at the Pre-Paving Conference. Discussion will not necessarily be limited to these items.

(a) Paving personnel to be assigned to the project.

(b) Changes made in plans during construction.

(c) Paving sequences.

(d) Number of trucks for hauling mix.

(e) Ticket takers.

(f) Job mix formulas.

(g) Project forms.

(h) Interpretations of special and supplemental or standard specifications.

(i) Special requests by the Resident Engineer.

(j) Determination of Acceptance Lab location.

(4) Weather

The surface upon which the mix is to be laid should be clean and dry. The use of "thick lift paving" may liberalize the strict interpretation usually placed upon the specification that mix not be placed on a wet surface. The fact that it is raining does not necessarily mean that the surface is too wet to be paved upon, particularly when paving upon gravel. In general, any pavement being placed that is 50 mm [2 in] or more in thickness would be considered "thick lift paving".

(a) When paving on gravel base, it would not be necessary to shutdown paving operations immediately if it started to rain. If, in the Resident's judgment, the rain is not causing a "wet surface" (401.07 of specifications), the Contractor may be permitted to continue placing the pavement course. The Contractor should be notified verbally or in written form that he is running the risk that placement will be suspended, and that mix in transit will not be placed if conditions change, and the Resident feels the conditions may be detrimental to the completed work. It should also be made clear that the Department cannot be held responsible if the work performed under the present conditions does not meet minimum acceptance criteria.

(b) When paving on a previously paved road, bituminous penetrated gravel, or reclaim material, the existing surface shall be dry to insure a proper bond between courses. Paving should not commence if it is raining. If the pavement is only damp and the weather is definitely clearing, the Department may determine that paving could begin.

When overtaken by rain, the Contractor may be allowed to continue until there is obvious free water on the existing pavement. It is not the Department’s policy to allow the placement of pavements until all mix in transit is placed. No guarantee can rightfully be given to place all mix in transit, as the length of haul varies from project to project. However, the Contractor can have the covered loaded trucks wait on the Project with the provision that if conditions improve before the mix becomes too cold, he might eventually place the mix.

(c) When placing a wearing course or level course, conditions must be such that the surface receiving the mix is thoroughly clean and dry. No mix should be placed on a damp surface unless overtaken by rain, and then only the mix that is in the truck unloading at the time, if the existing pavement is not too wet.

In summary, the thicker the lift, and the closer it is being placed to the lower portion of the entire pavement, such as a thick base course, the less stringent may be the interpretation of the "wet surface" requirement of the Specifications. Paving level and surface pavement courses in the rain should not be allowed. In all instances refer to the Contractor's QC plan on how they intend to handle wet conditions.

(5) Traffic Control

(a) Procurement of Flaggers: The Resident shall verify that the Contractor or Subcontractor has obtained the necessary Flaggers. The Resident or Inspector is responsible for the determination of the actual hours worked. Flaggers must conform to the Standard Specifications, Section 652.

(b) Use of Flaggers: The proper control of traffic through the work area is very important. The Resident or the Inspector must be sure that traffic is directed through the Paving Area in a manner that provides maximum safety for the workers and traffic with the least interruption of the work.

Three flaggers are normally used when traffic must be maintained immediately adjacent to the paving operation. They shall be instructed in the proper use of traffic control sign paddles and/or flags. Hand held signs have a standard STOP sign on one side and a SLOW sign on the other. Instructions regarding use of flags and paddles are in the Manual on Uniform Traffic Control Devices. The use of two-way radios to control traffic through the operation is required.

The first flagger should be posted about 150 to 250 m [500 to 800 ft] ahead of the paving operation to intercept on-coming traffic. They must always be sure to direct the traffic, when passing through, to the correct side of the road so as to keep it off the freshly laid mix. This flagger will have to move ahead intermittently to keep their relative position to the operation. Haul Trucks enroute to the paver must move with the direction of traffic, and should **NEVER** be given precedence over the traveling public.

The second flagger should be posted at a spot 60 m [200 ft] or so back of the beginning of the paving, where he also will intercept on-coming traffic. They also must always be sure to direct the traffic, when passing through, to the correct side of the road so as to keep it off the freshly laid mix. This flagger should move ahead only after the back-rolling is completed, and should be

kept back far enough so that the stopping traffic does not damage the pavement. Haul trucks enroute to the paver must move with the direction of traffic, and should **NEVER** be given precedence over the traveling public.

The third flagger shall be used as needed, normally being placed at the paver or at the position that will best protect the workers, the work, equipment, and help traffic through the Construction Area.

When conditions do not allow for proper approach sight distance of a flagger or storage space for waiting vehicles, an additional flagger shall be used at the rear of the backlogged traffic or at a point where approaching vehicles have adequate stopping sight distance to the rear of the backlogged traffic.

b. PAVING WORK

The construction of a Hot Mix Asphalt Pavement course begins with the delivery of the mixture to the project. The HMA pavement should be a workable mixture that has been proportioned and mixed in accordance with the governing specifications. The pavement shall be constructed of the type of mixture, number of courses, and at the depth as specified for the Project.

The Street Inspector will work with the Resident in determining when an area is ready to pave, and what is expected as the final result. The Street Inspector will then be responsible for determining that the correct procedures are being used and the specifications are being followed.

The Inspector must take an active part in the actual functioning of the paving operation and should be adequately equipped with the tools of the job, both knowledge and incidentals such as notebooks, thermometers, stringline, straightedges, etc. Their knowledge of the operation should include an excellent working knowledge of the construction equipment being used by the Contractor, but not act as a supervisor or laborer for the Contractor.

c. PLANNING AND PREPARATION

Before actual paving begins, the Street Inspector will go over the entire project with the Paving Contractor's Superintendent and/or Foremen. At this time, they will review the Contractor's Quality Control Plan, and plan of operation.

The base ahead of the Paving operation should be carefully inspected before placing any Hot Bituminous Mixture. When paving directly on aggregate courses, areas with potholes should be corrected by re-grading. Gravel base should be rolled just ahead of the paver to key the loose material. When cold mix

(cold patch) has been used for temporary patching, these patches shall be removed and replaced with hot mix before paving. When an existing pavement is to be resurfaced, the pavement shall be cleaned of dirt and other extraneous matter and all weak areas repaired. Pavements to be overlaid should be clean, dry, and free from foreign materials that may affect the long term performance of the overlay course.

Low or high areas found in the gravel base should be brought to the attention of the Resident. These areas should be re-graded and compacted.

d. PLACEMENT EQUIPMENT

Prior to paving operations, a careful inspection of all the equipment should be made. It should be checked periodically for general condition and proper adjustment. Knowledge of adjustments and the operation of equipment are of the utmost importance to the Inspector. The Inspector should have a working knowledge of the equipment being used in order to be able to detect, by visual defects in mat quality, or irregularities in the work, that the equipment is not functioning or being operated in the manner it should.

The Inspector shall not perform the duties of an operator, or to act as a laborer, as it is the Contractor's responsibility to maintain and operate their equipment properly. The Inspector should inform the Resident of any worn or malfunctioning equipment.

(1) Paving Machines:

The most important piece of equipment is the paver. There are many adjustments in the paver that directly affect the quality of the mat being spread. The Asphalt Paving Manual published by the Asphalt Institute, and by the equipment manufacturer, gives detailed points to check on pavers and other equipment.

Also available are handbooks by each manufacturer with detailed operating instructions and maintenance procedures. Some of the more important features to be checked on pavers are as follows:

(a) Observe the governor on the engine to see that it is operating properly.

(b) On machines with crawler type tracks, check adjustment of crawlers for proper tension. Track type pavers should move steadily, without lurching ahead with track turn.

(c) On pneumatic tired machines, check tires cuts, gouges, and for correct and uniform air pressure. Over inflated tires can cause excessive wheel spin, and affect the uniform forces acting on the screed.

(d) Check the screed for excessive wear and possible warping. Excessive use of the screed heaters can seriously warp the screed and affect the mat laydown quality.

(e) Check screed extensions for alignment and crown. Loose extensions can cause mat ripples and shadows.

(f) Grade or thickness controls, manual or automatic should be checked for proper operation and wear. Improperly maintained automation systems can dramatically increase the probability of a poor riding pavement surface course.

(g) Screed vibrators should be checked to see that they are all working. These help place the mat with a higher and more uniform density.

(h) Flow control gates should be properly adjusted. Improperly set flow gates can cause the head of material in front of the screed to fluctuate, causing variable mat depths, poor ride, and mat densities to fluctuate.

(i) Check the screed heater for proper working conditions. Improper heat can cause the screed to drag, leaving a poor mat texture, and porous appearance.

(j) Check that the push rollers on front of paver are clean and rolling freely. Rollers that do not roll freely can cause the paver's speed to fluctuate or travel as steered, causing variation in mat depth and texture.

(k) Check the augers for excessive wear. Worn augers can cause segregation as the material is moved ahead of the screed, cause mat streaking and varying mat densities.

(l) Do not allow the use of fuel oiling of the paver hopper before or during paving operations. Fuel oil use will cause mat defects, flushing areas, and will break down the structure of the bituminous pavement being placed.

(2) Rollers:

Rollers most commonly used for mix compaction are the two-axle tandem, static or vibratory, for knockdown rolling, the pneumatic roller (rubber tire) for intermediate rolling, and a two-axle tandem for final rolling. Each roller should be checked to see that it runs smoothly, reverses without jerking and that steel rolls are smooth, free of grooves, and unpitted. The watering system must function properly and the pads and scrapers must be in good condition.

When pneumatic tired rollers are used, the tires must be of equal size, ply, in good condition, and equally inflated. The ballast and tire pressure are generally up to the Contractor's discretion, but should remain consistent throughout the placement of the pavement course. All wheels should roll true, without wobble.

In no instances will petroleum products be allowed to be used as release agents on rollers.

(3) Miscellaneous Tools:

A check should be made to see that the Contractor has available on the project an adequate supply of rakes, lutes, shovels, brooms, hand tamps and other small tools. Petroleum products may not be used as release agents on these tools. The Contractor shall have available portable barricades, cones or other means of protecting the freshly laid mixture from damage by traffic.

The Contractor should also have available when necessary, a sidewalk roller and a vibratory compactor.

The 10 foot straightedge, required by specification to be supplied by the Contractor, should be checked for straightness and readable available at the paving site.

e. SPREADING AND FINISHING

Hot Mix Asphalt is usually placed by a self-propelled paver. In irregular areas, the mixture may be placed and finished by hand.

The Contractor will mark a paver guide line, which is usually based upon the construction centerline or control line. Regardless of what method is used for a guide line, the Inspector must be especially concerned that the proposed pavement will be in the proper location and the alignment is true with no sharp "yanks".

401-5 MEASUREMENT AND DOCUMENTATION

a. FIELD DOCUMENTATION

Project Diary, Inspector's Diary/Daily Report, Paving Report, Tally Sheet, Test and Data Reports: The Resident or Paving Inspector will document on a daily basis, the Contractor's paving operations. He/she will keep notes regarding: station to station limits of paving, inspection problems, and observations regarding quality control, equipment, personnel, weather, and temperatures. It is strongly suggested that

the Paving Inspector use the Paving Report; this document has a preprinted format that serves as a reminder to record all of this information. This report is to be filled in on a daily basis, prior to the start of the next day. If a ticket taker is available, he/she will keep a tally of all loads delivered by noting delivery slip number and location where placed. The primary purpose of the Truck Tally Sheet is to control the yield and to determine which loads are involved if a problem area develops. If the Resident can isolate the loads, he/she can correlate the questionable material with specific batching data on record in the plant and in this way the cause for the bad mix may be determined.

Contract specifications state that quality of mix will be controlled by following the Quality Assurance requirements of Sections 401 and 106 of the Standard Specifications. The Contractor will provide quality control by testing and inspection and will propose their quality control procedures by submitting a Quality Control Plan to the Resident for Departmental approval. The Standard Specifications, Section 401 outline the basic requirements of the Plan, and also procedures for quality assurance testing that the Department will perform.

Section 401 of the Special Provisions defines the Quality Assurance requirements at three levels: Methods A, B, and C. Method A provides for pay incentives and disincentives. Method B provides for disincentives only. Quality control and quality assurance procedures are the same for Methods A and B.

Method C is used for sidewalks, drives, and other mixes behind the curb that are generally referred to as "hand-placed". Quality control requirements are not as stringent as for Methods A and B. Section 401 defines the types and frequencies of Acceptance tests to be taken.

Special Provision, Section 403, designates which method is to be used for a particular pavement item, usually based on quantity. To better understand Quality Assurance procedures, and Methods A, B, and C, the contents of Standard Specification - Section 401 and Special Provision - Section 403 should be thoroughly read by the Resident and the Paving Inspector before paving operations begin. All Quality Assurance records will be filed together in the Testing File daily.

b. MEASUREMENT AND PAYMENT

The delivery slip for each load of hot mix asphalt delivered to the project will be signed at the point of delivery by the Resident, Inspector or Ticket Taker. Daily total quantities for each pay item will be documented by a cover slip signed by the Contractor's Representative and the Resident or Inspector, and will be entered in the Final Quantity Book; all entries will be signed and dated. Delivery slips will be kept in the Resident's field office until the records are submitted to the Project Review Unit for final review. At that time the weigh slips may be discarded, but the cover slips will be kept as part of the project records.

Occasionally a load will be split between two pay items. Quantities will be determined by fractions noted on the slip, example: "pay ? load as hand-placed". A rejected load will be documented by a note on the slip stating the reason such as: segregation, dry load, or low temperature.

Check-weighing to verify the accuracy of the scales will be done twice during every five days of production. Subsection 401.074 of the Standard Specifications explains the check weighing procedures. This is normally performed by Testing personnel.

Pay factor computations for incentives, disincentives, and penalties will be part of the Testing File, but final cost figures will be entered in the Final Quantity Book with the digits 01 and descriptions added to the pertinent pay item number, for example: 403.20801 Incentive-HMA-9.5 mm.

Final quantity for payment will be figured in the Final Quantity Book from daily totals and labeled as such. **All calculations and data entries must be signed, dated, and checked; the checker must sign and date his/her work.**

UNTREATED AGGREGATE SURFACE COURSE

411-1 GENERAL

References:

(1) Standard Specifications, Section - 703.10
(2) Special Provisions
(3) Standard Detail Sheets
(4) Project Plans - particularly Typical Sections
(5) Construction Notes & General Notes

This item is usually used as shoulder gravel or in incidentals like driveway lips and small areas such as between curbs in traffic islands.

411-2 LAYOUT AND CONTROL

Contractor personnel establishes horizontal control. It is only necessary to indicate the outside limits when required.

411-3 TESTING REQUIREMENTS

Refer to the project Minimum Testing requirements.

411-4 CONSTRUCTION

The Standard Specifications are quite explicit regarding the method of construction.

411-5 INSPECTION, MEASUREMENT & FIELD DOCUMENTATION

Refer to Section 304 Aggregate Base and Subbase Course of the Manual for information. This material is handled and documented the same as for that item.

411-6 COMPUTATION OF QUANTITIES

Refer to Section 304 Aggregate Base and Subbase Course of this Manual for information. The material is handled and documented the same for this item.

ASPHALT CRACK SEALING AND FILLING

424-1 GENERAL

References:

(1) Standard Specifications

Sections 105, 108

Section 700 - Materials (General Statement)

(2) Construction Notes

(3) Special Provisions

The purpose of crack sealing is to prolong the life of existing pavements, by preventing moisture from penetrating the roadway structure, and by preventing the spalling of material from the edges of the cracks.

424-2 LAYOUT AND CONTROL

Layout for placement is a protected and flagger-controlled work area. Caution should be used in determining when to move the lane closure ahead to prevent pickup of material in the travelway and at intersections.

424-3 TESTING REQUIREMENTS

The contractor shall submit a Materials Certification letter prior to acceptance, as specified in Section 700. Asphalt crack sealer may be subject to random sampling and testing by the Department.

424-4 CONSTRUCTION

It is essential that the work area is properly signed and protected before work commences. Usually there is no project approach signing erected for this type project, which is a moving type operation.

In crack cutting, the objective is to create a uniform, rectangular reservoir centered as closely as possible over a particular crack while inflicting as little damage as possible on the surrounding pavement.

Crack cleaning and drying provides a clean, dry crack channel, free of loosened pavement or asphalt fragments in which the crack treatment materials can be placed.

Next, the crack treatment material is prepared for the recommended application, and placed in the proper amount into or over the crack channel to be treated. Material application consists of maintaining the material at, or near the recommended application temperature without overheating. Maintain a sufficient supply of heated material in the kettle, and properly dispense the right amount of material into the crack channels.

424-5 INSPECTION - MEASUREMENT AND FIELD DOCUMENTATION

For crack cutting, the cutting tips or blades need to be checked for sharpness to minimize spalling and cracking. Also, check to see that the cutting equipment follows the crack with less than 5 percent missed. Dirt and debris need to be blown from crack channels and surrounding pavement to well off of the edge of the pavement. The melting vat must be kept at least one-third full of material to reduce the chance of burning the material or introducing air into the pumping system. This material has to be circulated during idle periods. Allow the materials to cool sufficiently to prevent tracking, given the type of traffic control setup and ambient conditions.

Record that the work has been done as specified.

Include in the Project Diary personnel and equipment used daily. Field measurements will be recorded directly in the Final Quantity Book, or another bound book.

Final Quantity for payment will be recorded in Final Quantity Book and referred to measurements and comps as appropriate, signed and dated. **All calculations and data entries must be signed, dated, and checked; the checker must sign and date his/her work.**