To:		*New York State Department of Transportation* ENGINEERING INSTRUCTION	EI 03-009

Title: **Specifications for Sawing and Sealing Joints in New Hot Mix Asphalt (HMA) Overlays and Preventive Maintenance Treatments**

Distribution:

- ☐ Manufacturers (18)
- ☐ Surveyors (33)
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- ☐ _____( )

Approved:

Robert L. Sack — 4 MAR 03

R. L. Sack, Deputy Chief Engineer, Technical Services Division — Date

ADMINISTRATIVE INFORMATION.

- This Engineering Instruction (EI) is effective with projects submitted for the letting of September 11, 2003.
- This EI supersedes Engineering Instruction 97-030 except for those specifications listed as unchanged.
- The special specifications will reside on the Department server and the Internet site.
- The pay items will be included in the Control Report of Contract Pay Items.

PURPOSE.

The purpose for this EI is to issue special specifications for sawing and sealing joints in hot mix asphalt overlays and preventive maintenance treatments for joints and cracks in HMA pavements.

TECHNICAL INFORMATION.

Interim Guidance:

Designers:

Refer to Chapter 10, Preventive Maintenance, of the *Comprehensive Pavement Design Manual (CPDM)* to select the most appropriate preventive maintenance treatment. Specify either Fiber Reinforced PG Binder or Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements meeting the requirements of ASTM D6690 Type II (formerly ASTM D3405) to fill shoulder joints. Contact Regional Materials Engineer for additional information and assistance in selecting the most appropriate preventive maintenance treatment.

The following Item Number Conversion Table identifies the old pay items, new pay items and provides a description for each item:

Old Item(s)	New Item	Description
18403.2502 M	18402.2502 M	Sawing and Sealing Joints in New Hot Mix Asphalt Overlays Using Hot Applied Sealant

Old Item(s)	New Item	Description
18403.7507 M 18403.7508 M	18402.7507xx M	Filling Shoulder Joints Between PCC Pavement and HMA Shoulders Using Fiber Reinforced PG Binder or Hot Applied Sealant
18403.7601 M 18403.7603 M 18403.78 M	18402.7601 M	Routing, Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement Using Hot Applied Sealant
18403.7602 M 18403.79 M	18402.7602 M	Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement Using Hot Applied Sealant

Engineer in Charge:
Dimensions - All dimensions of saw cut reservoirs, cracks that require routing and sealing or sealing only and thin film over band widths remain the same.

Policy Changes:

Policies regarding Sawing and Sealing Joints in HMA Overlays and Preventive Maintenance Joint and Crack Sealing remain unchanged. Decisions regarding saw cut locations, selection of maintenance treatment, whether a joint is to be routed prior to cleaning and sealing and the type of sealant that is to be used still remain the responsibility of Designers and Regional Maintenance Engineers. In addition, Regional Maintenance Engineers are still responsible for identifying and scheduling projects for pavement maintenance and rehabilitation.

Selective routing of cracks is included in Special Specification 18402.7601 M . This specification states that the Engineer will determine which cracks are to be routed prior to being cleaned and sealed based on their dimensions. This further allows the Engineer to instruct the Contractor to rout specific cracks as work is progressing.

Special Specification 18402.7507xx M, allows either fiber reinforced PG Binder or a hot applied joint sealant to fill and seal cracks between shoulder joints. This specification combines Special Specifications 18403.7507 M and 18403.7508 M and still allows either sealant to be used.

Changes:

Bituminous Concrete Overlay has been revised to Hot Mix Asphalt Overlay.

Asphalt Shoulders have changed to Hot Mix Asphalt Shoulders.

ASTM designation D3405 has been changed to ASTM D6690 Type II.

Fiber Reinforced PG Binder and sealants that meet the material requirements under Special Specification 18402.7507xx M are both acceptable for use in filling shoulder joints between PCC pavements and HMA shoulders.

Cost Impacts:
The issuance of the revised specifications will have no impact on costs.

IMPLEMENTATION.

Actions

On or after September 11, 2003, Regional Designers will need to insert special specifications into contract proposals requiring associated work.

New Specifications. The following specifications are new:

18402.2502 M	Sawing and Sealing Joints in New Hot Mix Asphalt Overlays Using Hot Applied Joint Sealant
18402.750701 M	Filling Shoulder Joints Between PCC Pavement and HMA Shoulders Using Fiber Reinforced PG Binder
18402.750702 M	Filling Shoulder Joints Between PCC Pavement and Hot Mix Asphalt Shoulders Using Hot Applied Sealant
18402.7601 M	Routing, Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement Using Hot Applied Sealant
18402.7602 M	Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement Using Hot Applied Sealant

Unchanged Specifications. The following specifications remain unchanged:

18502.701002 M	Resealing Transverse Joints in Portland Cement Concrete Pavement, 19m Pavement Slabs - Silicone Sealant
18502.702002 M	Resealing Transverse Joints in Portland Cement Concrete Pavement, 6m Pavement Slabs - Silicon Sealant
18502.7401 M	Resealing Longitudinal Joints in Portland Cement Concrete Pavement
18502.7601 M	Sealing Cracks in PCC Pavements - Silicone Sealant

Disapproved Specifications. The following specifications are disapproved:

18403.2502 M	Sawing and Sealing Joints in Bituminous Concrete Overlays
18403.7508 M	Filling Shoulder Joints Between Portland Cement Concrete Pavement and Asphalt Concrete Shoulders Using ASTM D3405
18403.7507 M	Filling Shoulder Joints Between Portland Cement Concrete Pavement and Asphalt Shoulders Using Fiber Reinforced Asphalt Cement
18403.7601 M	Routing, Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement, ASTM D3405
18403.7602 M	Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement, ASTM D3405
18403.7603 M	Routing, Cleaning and Sealing Cracks in Hot Mix Asphalt Pavement, ASTM D3405 (Payment by Liter)
18403.78 M	Selective Routing of Cracks in Hot Mix Asphalt Pavement
18403.79 M	Cleaning and Sealing Cracks With Selective Routing in Hot Mix Asphalt Pavement, ASTM D3405

TRANSMITTED MATERIALS. The full text of the special specifications is available with the electronic version of this EI on the Departments web site at www.dot.state.us "Site Index", "S", "Special Specifications" in the area designated by prefix "18".

BACKGROUND. In response to EI 02-001, Specification Revisions: Sections - 401, 402 and 403 Hot Mix Asphalt this EI replaces special specifications beginning with 18403. as listed above. In addition, the American Society for Testing and Materials (ASTM) has changed the designation for Hot Applied Joint Sealants for Concrete and Asphalt Pavements from ASTM D3405 to ASTM D6690, Type II.

REFERENCES.
Consult Chapter 10, Preventive Maintenance of the *Comprehensive Pavement Design Manual* and § 18402-00 Joint and Crack Sealing of the *Construction Inspection Manual* for further details pertaining to pavement preventive maintenance joint and crack sealing treatments.

CONTACT. Direct any questions regarding this EI or the attached specifications to the Materials Bureau General Engineering Section at (518) 457-4285.

ITEM 18402.2502 M - SAWING AND SEALING JOINTS IN NEW HOT MIX ASPHALT OVERLAYS USING HOT APPLIED SEALANT

DESCRIPTION

Saw cut, clean and seal transverse joints in new Hot Mix Asphalt (HMA) overlays and shoulders. Construct transverse HMA pavement joints over, and in line with, the existing underlying transverse Portland cement concrete joints contained in the contract documents and as directed by the Engineer.

MATERIALS

Sealant. Use a sealant meeting the requirements of ASTM D6690 Type II; Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements (formerly ASTM D3405). Deliver the sealant in the manufacturer's original sealed container. The material will be accepted on the basis that the name of the supplier and brand name appears on the current Highway Joint Sealant (ASTM D6690 Type II) Approved List and that each container is marked with the following information:

Suppliers' name
Brand name of the sealant
Manufacturer's lot or batch number
Pouring temperature
Safe heating temperature

Provide the Engineer with a copy of the manufacturer's recommendations pertaining to heating and application of the sealant prior to commencing work.

Bond Breaker Tape. Use ordinary masking tape or a suitable bond breaker tape designed for use with hot poured sealants. The width of the tape shall be equal to the width of the saw cut (-3mm, +0 mm).

CONSTRUCTION DETAILS

General. Saw cut, clean and seal transverse joints as a single operation within seven (7) days after placing the top course of the HMA pavement. Saw cut, clean and seal joints that are damaged by traffic at no additional cost to the State.

If the top course is to be placed the following Spring, saw cut all underlying courses to provide a 25 mm deep by 3 mm wide channel to facilitate and control reflective cracking. Provide a means of properly referencing the saw cut to be made in the top course. Saw cut all underlying courses within seven (7) days after they are placed and before any evidence of reflective cracking has developed. Do not seal these saw cuts. Include saw cutting underlying courses in the unit bid price.

Saw Cutting of Transverse Joints. Saw cut transverse joints to the appropriate dimensions shown in Figure I and Figure II. Locate saw cut joints directly over the existing Portland cement concrete pavement joints using a pins and stringline method. The details of the method for locating the saw cuts are to be

approved by the Engineer.

Saw cutting blades shall be of such size and configuration that the desired dimensions of the saw cut can be made with one pass. Either dry or wet cutting will be allowed. No spacers between blades will be allowed.

Extend transverse saw cut joints the full width of the pavement and into the asphalt shoulder to a distance one meter beyond the edge of the underlying Portland cement concrete pavement edge or as shown in the contract documents. Transverse joints that are offset at the longitudinal joint by more than 25 mm measured between the centers of the joint cavities, require separate saw cuts terminating at the longitudinal joints.

Joint Preparation. Prepare joints for sealing on the same day that they are to be sealed.

Wash wet saw cut joints with a water blast (345 kPa minimum) after sawing to remove any sawing slurry, dirt, or deleterious matter adhering to the joint walls or remaining in the joint cavity. Wash slurry from the pavement surface when the wet process is used. Blow or brush dry dust and material from the pavement surface when the dry saw cut process is used.

Use a high pressure air lance or hot air lance to thoroughly clean and dry saw cut joints of dust, dirt, foreign material, sand and any other extraneous materials immediately prior to sealing joints. Do not burn, scorch or ignite the adjoining pavement when using a hot air lance.

Install suitable traps or devices on the compressed air equipment to prevent moisture and oil from contaminating the joint crack surfaces. Maintain these devices and see that they are functioning properly.

Protect the public from potentially objectionable and/or hazardous airborne debris.

Bond Breaking. Place bond breaker tape in the bottom of the saw cut joint after it is cleaned and dried.

Sealant Melting. Heat and melt the sealant in a melter constructed either as a double boiler filled with a heat-transfer medium between the inner and outer shells, or with internal tubes or coils carrying the sealant through a heated oil bath and into a heated double wall hopper. The melter will be equipped with separate thermometers to indicate the temperature of the heat transfer medium and the sealant material, positive temperature controls and with a mechanical agitator or a recirculating pump to assure a homogeneous blend of the sealant. Maintain the sealant at the pouring temperature ± 5°C indicated on the material packaging.

Check the discharge temperature of the sealant with a non-contact infrared thermometer. Discharge the sealant at a temperature between the manufacturer's recommended pouring and safe heating temperatures indicated on the material packaging. Submit an alternate method for measuring the discharge temperature to the Engineer for approval if desired.

ITEM 18402.2502 M - SAWING AND SEALING JOINTS IN NEW HOT MIX ASPHALT OVERLAYS USING HOT APPLIED SEALANT

Sealing is not permitted if the melter and discharge temperatures do not meet the requirements described above.

Equip the discharge hose with a thermostatically controlled heating apparatus or insulate it to maintain the proper sealant pouring temperature. Holster the discharge hose to the melter if it is not thermostatically heat controlled. Circulate the sealant from the discharge hose and the melter to maintain the proper sealant pouring temperature.

Do not use sealant material heated beyond the safe heating temperature.

If the manufacturer's recommendations allow the sealant to be reheated or heated in excess of six hours, recharge the melter with fresh material amounting to at least 20 percent of the volume of the material remaining in the melter.

Sealing. Sealing is to be done when ambient air temperature is at or above 5°C.

Seal the joint by placing the applicator wand in the recess and carefully discharge the sealant. Strike-off the sealant flush with the pavement surface using a squeegee or sealing shoe pressed firmly against the pavement. The level of the sealer will not be greater than 3 mm below the pavement or shoulder surface after the sealant has cooled. If the sealant sinks into the joint more than 3 mm below the pavement surface, clean it with high pressure air and fill it to 3 mm below the pavement surface. Properly sealed joints shall be watertight and present a neat fine line.

Do not allow traffic on the sealed joint until the sealant has cured so as not to track. Use a low pressure, light spray of water to accelerate cooling of the sealant. Blotting the sealant with fine aggregate is not allowed.

Remove and dispose sealant in excess of the amount depicted in Figure I or that has not bonded to both sides of the reservoir. Clean sealed joints damaged from traffic with high pressure air and reseal them to meet the specified amount at no additional cost to the State.

METHOD OF MEASUREMENT

The Engineer will measure the number of meters of joints properly saw cut and sealed in conformance with this specification.

BASIS OF PAYMENT

In the unit bid price, include the cost of all material, equipment and labor necessary to complete the work.

Item No.	Item	Pay Unit
18402.2502 M	Sawing and Sealing Joints in New Hot Mix Asphalt Overlays Using Hot Applied Sealant	Meter

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ITEM 18402.2502 M - SAWING AND SEALING JOINTS IN NEW HOT MIX ASPHALT OVERLAYS USING HOT APPLIED SEALANT

DETAILS FOR TRANSVERSE JOINTS IN HOT MIX ASPHALT OVERLAYS

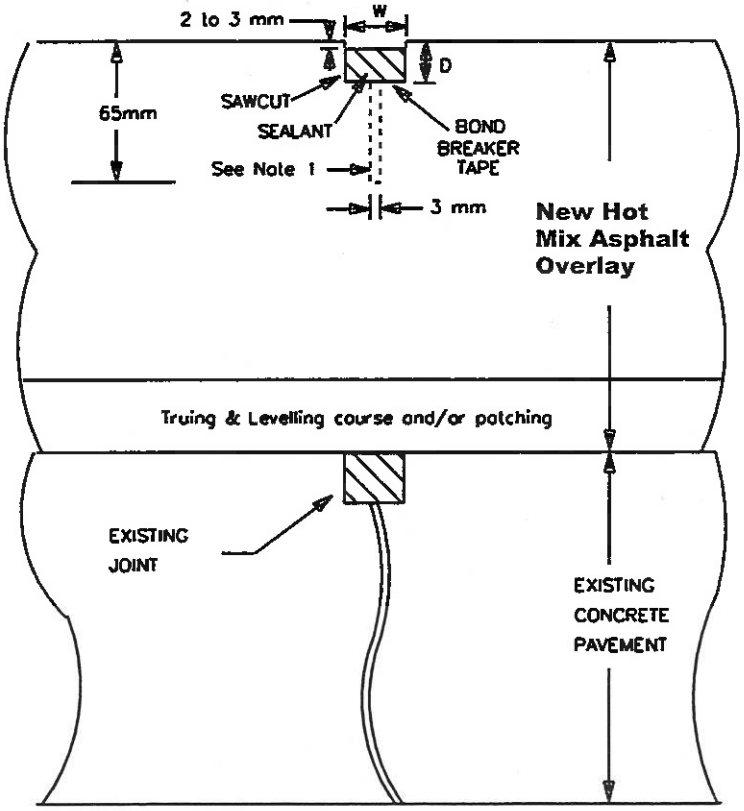
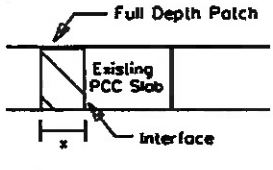


FIGURE I

SAWCUT DIMENSIONS

SLAB LENGTH (m)	W (mm)	D (mm)
< 15	13	16
16 to 19	16	16
20 to 23	19	16
24 to 27	22	19
28 to 31	25	22

Note 1: When the total thickness of hot mix asphalt over the existing joint exceeds 115mm, a 3mm wide sawcut shall be included in the joint geometrics to a minimum depth of 65mm.



If "x" is geater than 150 mm, a sawcut is required at patch slab interface in the overlay.

FIGURE II PLAN VIEW

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ITEM 18402.7507XX M - FILLING SHOULDER JOINTS BETWEEN PCC PAVEMENT AND HMA SHOULDERS USING FIBER REINFORCED PG BINDER OR HOT APPLIED SEALANT

DESCRIPTION

Clean and fill the shoulder joint between Portland cement concrete pavement and hot mix asphalt shoulders at locations shown in the contract documents or where directed by the Engineer.

MATERIALS

Use fiber reinforced Performance-Graded (PG) Binders or crack sealants that meet the following requirements:

Performance-Graded Binder: Use a PG binder supplied by a primary source as defined in Section 702 and meeting the specification for PG 64-22 or PG 64-28. Acceptance for use is contingent upon certification of compliance to these specification requirements by the primary source and subsequent suppliers.

Fibers: Acceptance of the polyester fibers is based on the manufacturer certification that the fibers meet with the following:

Type of Fiber: Polyester
Tensile Strength: 480 MPa min.
Specific Gravity: 1.32-1.40
Melt Temperature: 246°C min.
Elongation: 33% ± 9%
Length of Fiber: 6 mm ± 0.7 mm

Legibly mark containers with the following information:

Manufacturer's Name
Trade Name of Fiber
Type of Fiber

Composition of Sealant and Polyester Fiber Mixture: Mix a PG binder meeting the requirements of PG 64-22 or PG 64-28 with polyester fibers until there is a minimum of 5.0%, by weight, of polyester fibers.

Mixing Temperatures: Mix the PG binder and fibers at the temperatures recommended by the fiber manufacturer. The mixing temperature is not to exceed 163°C.

Crack Sealant. Use a sealant meeting the requirements of ASTM D6690 Type II; Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements (formerly ASTM D3405). Deliver the

sealant in the manufacturer's original sealed container. The material will be accepted on the basis that the name of the supplier and brand name appears on the current Highway Joint Sealant (ASTM D6690 Type II) Approved List and that each container is marked with the following information:

Supplier's name
Brand name of the sealant
Manufacturer's lot or batch number
Pouring temperature
Safe heating temperature

Supply the Engineer with the manufacturer's recommendations pertaining to the heating, mixing, and application of the materials used as filler.

CONSTRUCTION DETAILS

General. Furnish all equipment that is necessary for filling/sealing the shoulder joints. Use equipment meeting the description and/or performance requirements described herein and approved by the Engineer.

Replace pavement markings that become covered and/ or obliterated more than 25% of their width with sealant at no additional cost to the State.

Joint Preparation. Prepare joints for filling/sealing on the same day that they are to be sealed.

Use a high pressure air lance or hot air lance to thoroughly clean and dry joints of dust, dirt, foreign material, sand and any other extraneous materials immediately prior to sealing joints. Do not burn, scorch or ignite the adjoining pavement when using a hot air lance.

Install suitable traps or devices on the compressed air equipment to prevent moisture and oil from contaminating the joint surfaces. Maintain these devices and see that they are functioning properly.

Protect the public from potentially objectionable and/or hazardous airborne debris.

Filler/Sealer Melting. Heat and melt the filler/sealant in a melter constructed either as a double boiler filled with a heat-transfer medium between the inner and outer shells, or with internal tubes or coils carrying the filler/sealant through a heated oil bath and into a heated double wall hopper. The melter will be equipped with separate thermometers to indicate the temperature of the heat transfer medium and the sealant material, positive temperature controls and with a mechanical agitator or a recirculating pump to assure a homogeneous blend of the sealant. Maintain the sealant at the pouring temperature ± 5°C indicated on the material packaging.

ITEM 18402.7507XX M - FILLING SHOULDER JOINTS BETWEEN PCC PAVEMENT AND HMA SHOULDERS USING FIBER REINFORCED PG BINDER OR HOT APPLIED SEALANT

Check the discharge temperature of the filler/sealant with a non-contact infrared thermometer. Discharge the sealant at a temperature between the manufacturer's recommended pouring and safe heating temperatures indicated on the material packaging. Submit an alternate method for measuring the discharge temperature to the Engineer for approval if desired.

Filling/sealing is not permitted if the melter and discharge temperatures do not meet with the requirements described above.

Equip the discharge hose with a thermostatically controlled heating apparatus or insulate it to maintain the proper sealant pouring temperature. Holster the discharge hose to the melter if it is not thermostatically heat controlled. Circulate the filler from the discharge hose and the melter to maintain the proper filler/sealant pouring temperature.

Do not use filler/sealant material heated beyond the safe heating temperature.

If the manufacturer's recommendations allow the filler/sealant to be reheated or heated in excess of six hours, recharge the melter with fresh material amounting to at least 20 percent of the volume of the material remaining in the melter.

Filling and Sealing. Filling and sealing is to be done when ambient air temperature is at or above 5°C.

Overfill the joint by placing the applicator wand in or directly over the recess and carefully discharge the filler. Strike off the joint using a (neoprene type) "V" shaped squeegee or sealing shoe that is capable of conforming to the pavement surface. Form a band 100 mm wide and 1.5 mm to 3 mm thick, with tapered edges, centered over the joint. The distance between the filler/sealant applicator wand and the squeegee shall not exceed 600 mm. Properly filled/sealed joints shall be watertight.

Do not allow traffic on the filler or sealant until it has cured so as not to track. A low pressure light spray of water may be used to accelerate cooling of the filler/sealant. Blotting with fine aggregate is not allowed.

Remove and dispose filler/sealant in excess of the specified thin "film" dimensions or that has not bonded to both sides of the joint. Clean filled/sealed joints damaged from traffic with high pressure air and reseal them to meet the specified thin film amount at no additional cost to the State.

METHOD OF MEASUREMENT

The Engineer will measure the number of liters of sealant used to properly fill the shoulder joints in conformance with this specification.

ITEM 18402.7507XX M - FILLING SHOULDER JOINTS BETWEEN PCC PAVEMENT AND HMA SHOULDERS USING FIBER REINFORCED PG BINDER OR HOT APPLIED SEALANT

BASIS OF PAYMENT

In the unit bid price, include the cost of all material, equipment and labor necessary to complete the work.

Item No.	Item	Unit
18402.750701 M	Filling Shoulder Joints Between PCC Pavement and HMA Shoulders Using Fiber Reinforced PG Binder	Liter
18402.750702 M	Filling Shoulder Joints Between PCC Pavement and HMA Shoulders Using Hot Applied Sealant	Liter

ITEM 18402.7601 M - ROUTING, CLEANING AND SEALING CRACKS IN HOT MIX ASPHALT PAVEMENT USING HOT APPLIED SEALANT

DESCRIPTION

Rout, clean and seal only primary cracks at locations shown in the contract documents or where directed by the Engineer along their entire length. Do not treat secondary radial cracks. The Engineer will determine which cracks are to be routed prior to cleaning and sealing. In this specification, the word crack also means joint.

Primary cracks are defined as those greater than or equal to 3 mm and less than or equal to 25 mm wide.

MATERIALS

Crack Sealant. Use a sealant meeting the requirements of ASTM D6690 Type II; Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements (formerly ASTM D3405). Deliver the sealant in the manufacturer's original sealed container. The material will be accepted on the basis that the name of the supplier and brand name appears on the current Highway Joint Sealant (ASTM D6690 Type II) Approved List and that each container is marked with the following information:

Supplier's name
Brand name of the sealant
Manufacturer's lot or batch number
Pouring temperature
Safe heating temperature

Provide the Engineer with a copy of the manufacturer's recommendations pertaining to heating and application of the sealant prior to commencing work.

CONSTRUCTION DETAILS

General. Complete all pavement repairs contained in the contract documents bordering pavement cracks prior to commencing work.

Furnish all equipment that is necessary for routing, cleaning, and sealing the pavement cracks. Use equipment meeting the description and/or performance requirements described herein and approved by the Engineer.

ITEM 18402.7601 M - ROUTING, CLEANING AND SEALING CRACKS IN HOT MIX ASPHALT PAVEMENT USING HOT APPLIED SEALANT

Replace pavement markings that become covered and/or obliterated more than 25% of their width with the sealant at no additional cost to the State.

Crack Preparation. Prepare cracks for sealing on the same day that they are to be sealed.

Rout all primary cracks as defined above with a router to provide at least a 16 mm wide by 13 mm deep vertical-edged reservoir with minimal spalls at its edges.

Use a high pressure air lance or hot air lance to thoroughly clean and dry routed cracks of dust, dirt, foreign material, sand and any other extraneous materials immediately prior to sealing joints. Do not burn, scorch or ignite the adjoining pavement when using a hot air lance.

Install suitable traps or devices on the compressed air equipment to prevent moisture and oil from contaminating the joint surfaces. Maintain these devices and see that they are functioning properly.

Protect the public from potentially objectionable and/or hazardous airborne debris.

Sealant Melting. Heat and melt the sealant in a melter constructed either as a double boiler filled with a heat-transfer medium between the inner and outer shells, or with internal tubes or coils carrying the sealant through a heated oil bath and into a heated double wall hopper. The melter will be equipped with separate thermometers to indicate the temperature of the heat transfer medium and the sealant material, positive temperature controls and with a mechanical agitator or a recirculating pump to assure a homogeneous blend of the sealant. Maintain the sealant at the pouring temperature ± 5°C indicated on the material packaging.

Check the discharge temperature of the sealant with a non-contact infrared thermometer. Discharge the sealant at a temperature between the manufacturer's recommended pouring and safe heating temperatures indicated on the material packaging. Submit an alternate method for measuring the discharge temperature to the Engineer for approval if desired.

Sealing is not permitted if the melter and discharge temperatures do not meet with the requirements described above.

Equip the discharge hose with a thermostatically controlled heating apparatus or insulate it to maintain the proper sealant pouring temperature. Holster the discharge hose to the melter if it is not thermostatically heat controlled. Circulate the sealant from the discharge hose and the melter to maintain the proper sealant pouring temperature.

Do not use sealant material heated beyond the safe heating temperature.

ITEM 18402.7601 M - ROUTING, CLEANING AND SEALING CRACKS IN HOT MIX ASPHALT PAVEMENT USING HOT APPLIED SEALANT

If the manufacturer's recommendations allow the sealant to be reheated or heated in excess of six hours, recharge the melter with fresh material amounting to at least 20 percent of the volume of the material remaining in the melter.

Sealing. Sealing is to be done when ambient air temperature is at or above 5°C.

Seal the routed crack by placing the applicator wand in or directly over the recess and carefully discharge the sealant. Strike-off the sealant flush with the pavement surface using a squeegee or sealing shoe pressed firmly against the pavement. Only a narrow thin film of material measuring from 25 mm to 50 mm wide and 1 mm thick is allowed on the pavement surface after sealing the reservoir. If the sealant sinks into the reservoir more than 10 mm below the pavement surface, clean it with high pressure air and seal it to meet the specified thin film amount. Properly sealed joints shall be watertight.

A low pressure, light spray of water may be used to accelerate cooling of the sealant. Blotting the sealant with fine aggregate is not allowed.

Remove and dispose sealant in excess of the specified thin "film" dimensions or that has not bonded to both sides of the reservoir.

Do not allow traffic on the sealed reservoirs until the seal has cured so as not to track. Clean sealed reservoirs damaged from traffic with high pressure air and reseal them to meet the specified thin film amount at no additional cost to the State.

METHOD OF MEASUREMENT

The Engineer will measure the number of meters of cracks properly routed, cleaned and sealed in conformance with this specification.

BASIS OF PAYMENT

In the unit bid price, include the cost of all material, equipment and labor necessary to complete the work.

Item No.	Item	Pay Unit
18402.7601 M	Routing, Cleaning and Sealing Cracks in HMA Pavements Using Hot Applied Sealant	Meter

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4/24/97
06/18/02

ITEM 18402.7602 M - CLEANING AND SEALING CRACKS IN HOT MIX ASPHALT PAVEMENT USING HOT APPLIED SEALANT

DESCRIPTION

Clean and seal only primary cracks at locations shown in the contract documents or where directed by the Engineer along their entire length. Do not treat secondary radial cracks. The Engineer will determine which cracks are to be cleaned and sealed. In this specification, the word crack also means joint.

Primary cracks are defined as those greater than or equal to 3 mm and less than or equal to 25 mm wide.

MATERIALS

Crack Sealant. Use a sealant meeting the requirements of ASTM D6690 Type II; Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements (formerly ASTM D3405). Deliver the sealant in the manufacturer's original sealed container. The material will be accepted on the basis that the name of the supplier and brand name appears on the current Highway Joint Sealant (ASTM D6690 Type II) Approved List and that each container is marked with the following information:

Supplier's name
Brand name of the sealant
Manufacturer's lot or batch number
Pouring temperature
Safe heating temperature

Provide the Engineer with a copy of the manufacturer's recommendations pertaining to heating and application of the sealant prior to commencing work.

CONSTRUCTION DETAILS

General. Complete all pavement repairs contained in the contract documents bordering pavement cracks prior to commencing work.

Furnish all equipment that is necessary for cleaning and sealing the pavement cracks. Use equipment meeting the description and/or performance requirements described herein and approved by the Engineer.

Replace pavement markings that become covered and/ or obliterated more than 25% of their width with the sealant at no additional cost to the State.

Crack Preparation. Prepare cracks for sealing on the same day that they are to be sealed.

Use a high pressure air lance or hot air lance to thoroughly clean cracks to a minimum depth of 13 mm of dust, dirt, foreign material, sand and any other extraneous materials immediately prior to sealing. Do not burn, scorch or ignite the adjoining pavement when using a hot air lance.

Install suitable traps or devices on the compressed air equipment to prevent moisture and oil from

contaminating the crack surfaces. Maintain these devices and see that they are functioning properly.

Protect the public from potentially objectionable and/or hazardous airborne debris.

Sealant Melting. Heat and melt the sealant in a melter constructed either as a double boiler filled with a heat-transfer medium between the inner and outer shells, or with internal tubes or coils carrying the sealant through a heated oil bath and into a heated double wall hopper. The melter will be equipped with separate thermometers to indicate the temperature of the heat transfer medium and the sealant material, positive temperature controls and with a mechanical agitator or a recirculating pump to assure a homogeneous blend of the sealant. Maintain the sealant at the pouring temperature ± 5°C indicated on the material packaging.

Check the discharge temperature of the sealant with a non-contact infrared thermometer. Discharge the sealant at a temperature between the manufacturer's recommended pouring and safe heating temperatures indicated on the material packaging. Submit an alternate method for measuring the discharge temperature to the Engineer for approval if desired.

Sealing is not permitted if the melter and discharge temperatures do not meet with the requirements described above.

Equip the discharge hose with a thermostatically controlled heating apparatus or insulate it to maintain the proper sealant pouring temperature. Holster the discharge hose to the melter if it is not thermostatically heat controlled. Circulate the sealant from the discharge hose and the melter to maintain the proper sealant pouring temperature.

Do not use sealant material heated beyond the safe heating temperature.

If the manufacturer's recommendations allow the sealant to be reheated or heated in excess of six hours, recharge the melter with fresh material amounting to at least 20 percent of the volume of the material remaining in the melter.

Sealing. Sealing is to be done when ambient air temperature is at or above 5°C.

Seal the crack by placing the applicator wand in or directly over the crack opening and carefully discharge the sealant. Strike-off the sealant flush with the pavement surface using a squeegee or sealing shoe pressed firmly against the pavement. Only a narrow thin film of material measuring from 25 mm to 50 mm wide and 1 mm thick is allowed on the pavement surface after sealing the crack. If the sealant sinks into the crack more than 10 mm below the pavement surface, clean it with high pressure air and seal it to meet the specified thin film amount.

A low pressure, light spray of water may be used to accelerate cooling of the sealant. Blotting the sealant with fine aggregate is not allowed.

ITEM 18402.7602 M - CLEANING AND SEALING CRACKS IN HOT MIX ASPHALT PAVEMENT USING HOT APPLIED SEALANT

Remove and dispose sealant in excess of the specified thin "film" dimensions or that has not bonded to both sides of the crack.

Do not allow traffic on the sealed cracks until the seal has cured so as not to track. Clean sealed cracks damaged from traffic with high pressure air and reseal them to meet the specified thin film amount at no additional cost to the State.

The finished work shall produce a water tight crack sealed flush with the pavement surface.

METHOD OF MEASUREMENT

The Engineer will measure the number of liters of sealant used to properly clean and seal cracks in conformance with this specification.

BASIS OF PAYMENT

In the unit bid price, include the cost of all material, equipment and labor necessary to complete the work.

Item No.	Item	Pay Unit
18402.7601 M	Cleaning and Sealing Cracks in HMA Pavements Using Hot Applied Sealant	Liter