Chapter 4 Construction Details

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Chapter 4 Construction Details

Section 37 Seal Coats

4-3701 General Information

This section provides guidelines for inspecting work for applying seal coats as specified under Section 37, "Seal Coats," of the *Standard Specifications*, which includes chip seals, slurry seals, micro-surfacing, fog seals, flush coats, parking area seals, and crack treatments.

Chip seal is an application of bituminous material followed by a layer of aggregate screenings, for example, chips, and rolling. Chip seals include: asphaltic emulsion chip seals, polymer modified asphaltic emulsion chip seals, scrub seals, asphalt rubber binder chip seals, stress absorbing membrane interlayers (SAMI), and modified asphalt binder chip seals.

Asphaltic emulsion chip seals and polymer modified asphaltic emulsion chip seals placed in two layers are referred to as double chip seals.

Chip seals that use a hot asphalt binder, for example, asphalt rubber binder chip seal and modified asphalt binder, are often referred to as "hot applied chip seal." Chip seals that use an emulsion are often referred to as a "cold applied chip seal." Hot applied chip seals can be placed at night.

Scrub seal is a more advanced and aggressive multi-step chip seal process that uses a specialized emulsion as an asphalt concrete rejuvenator and chip binder in conjunction with a mechanized scrub broom that forces the optimum amount of emulsion into existing pavement surface cracks.

SAMI is a chip seal in which a modified binder, such as asphalt rubber, is applied at a much higher rate than used for a conventional chip seal. A SAMI is placed beneath a new overlay to retard reflection cracking.

Slurry seal is an application of a slurry mixture of water, asphaltic emulsion or polymer modified asphaltic emulsion, fine aggregate, and set-control additives applied to a pavement surface. Slurry seals are applied with a specialized vehicle with separate compartments for the ingredients and an on-board mixer. The slurry mixture flows onto the pavement within the confines of a distributor box attached to the rear of the vehicle. The box distributes the slurry mixture over the pavement to the approximate thickness of the largest aggregate (1/4- to 3/8-inch). Workers with squeegees assist in spreading the mixture, correcting areas not properly covered, and preventing the mixture from flowing to areas that are not intended to be covered. Slurry seals can only be applied in one layer.

Micro-surfacing is similar to a slurry seal except it requires a more advanced polymer modified asphaltic emulsion, a more durable fine aggregate, and a chemical additive. The major difference between slurry seal and micro-surfacing is in how they break or harden. Slurry seal relies on evaporation of the water in the asphaltic emulsion. The chemical additive in a micro-surfacing allows it to break without

relying on sun or heat for evaporation. The hardening rate of a micro-surfacing allows it to be used where a slurry seal cannot be used. Micro-surfacing is applied with more advanced equipment than a slurry seal. It can be applied thicker than the largest aggregate and applied in multiple layers to address surface irregularities including rutting.

Fog seal is an application of a diluted slow-setting asphaltic emulsion or quick setting asphaltic emulsion applied over the existing pavement or a chip seal.

Flush coat is the application of a fog seal followed by the application of sand. To eliminate further aggregate loss and improve durability, flush coats are always specified to be placed over chip seals and SAMIs before opening pavement to traffic.

Parking area seal is the application of a mixture of asphaltic emulsion, aggregate, polymer, and water to parking areas.

Crack treatment is the cleaning, preparation, and sealing of existing cracks in asphalt concrete pavement.

Seal coats are primarily used to maintain existing asphalt concrete pavement. Seal coats on new work are generally limited to fog seal on areas of hot mix asphalt that have been ground for smoothness corrections, asphalt concrete dikes, miscellaneous areas, and shoulders.

4-3702 Chip Seals

The following covers the duties required throughout each phase of the project for chip seals.

4-3702A Before Work Begins

Before work begins, take the following steps:

- A minimum of 15 days before starting placement of chip seal, make sure the contractor submits:
  1. Samples of the uncoated aggregate
  2. Depending on the type of chip seal, samples of asphaltic emulsion, polymer modified asphaltic emulsion, or asphalt rubber binder
  3. Binder data for asphaltic emulsion, polymer modified asphaltic emulsion, asphalt binder or asphalt rubber binder
  4. Contractor's aggregate test results
  5. Contractor's Vialit test for aggregate retention in chip seals test results
- Test the uncoated aggregate, asphaltic emulsion, polymer modified asphaltic emulsion, or asphalt rubber binder asphalt binder for all of the quality characteristics. Advise the contractor of test results.
- A minimum of 10 days before starting chip seal activities, make sure the contractor submits the names of proposed authorized laboratories for quality

control testing. Authorize the laboratories based on the requirements of Section 37-1.01D, "Quality Assurance," of the *Standard Specifications*.

- A minimum of 10 days before the preconstruction meeting, make sure the contractor submits a list of participants in the preconstruction meeting, including the participants' names, employer, title, and role in the production and placement of the chip seal.
- Hold the preconstruction meeting a minimum of 5 days before the start of the chip seal work. At the preconstruction meeting discuss the contractor's quality control program and method for performing each element of work affecting material quality including:
  - Frequency of quality control sampling and testing that meets or exceeds specification requirements listed in the quality control sections of the *Standard Specifications*.
  - Time and frequency of submitting test results.
  - Responsibilities of quality control laboratories.
- Verify that the contractor posts "No Parking—Tow Away" signs a minimum of 24 hours before placing chip seal if chip seal affects public parking.
- Examine the surface to be sealed. Prepare a change order to provide for any necessary corrective action such as sealing cracks and repairing failed areas. At this stage, a review with the maintenance region manager or area superintendent would be helpful.
- A minimum of 7 days before starting placement of the chip seal, make sure contractor submits a written list of areas deemed defective, for example, those that have rutting in excess of 3/8 inch or are exhibiting flushing. Provide a written response indicating your agreement or disagreement with each of the areas. Caltrans' acceptance does not apply to areas where you agree the existing pavement is defective before placement of the chip seal.
- When the chip seal includes pre-coated aggregate, verify that the contractor's central mixing plant has been authorized under Caltrans' Material Plant Quality Program (MPQP). For additional information refer to Section 3-902E, "Weighing Equipment and Procedures," of this manual.
- Review the contract to determine the type of seal coat required. Note the particular type of bituminous binder to be used, and the requirements for aggregates. Decide whether any conditions have changed from those upon which the design engineer based the requirements, and propose any necessary changes.
- For asphalt rubber seal coats, verify that the contractor has submitted the permits issued by the local air quality agency for asphalt rubber binder field blending and application equipment.
- If an air quality permit is not required by the local air quality agency for producing asphalt rubber binder or spray applying asphalt rubber binder, verify that the

contractor submits verification from the local air quality agency that an air quality permit is not required for the contract.

- Verify that Form DOT CEM-3101, "Notice of Materials to Be Used," includes seal coat materials. Refer to Section 6-202, "Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products," of this manual for additional information.
- Make sure the aggregate material source complies with Section 7-103H (2), "Surface Mining and Reclamation Act," of this manual.
- Review the project to determine all requirements for handling traffic. Review required traffic control system and traffic control devices with the contractor.
- Make sure contractor submits an aggregate spread rate and bituminous binder spread rate. Review the spread rates and authorize if rates are within the specified allowable range.
- For the type of chip seal specified, review the contract documents to determine the specifications related to weather; the success of a chip seal is highly dependent on weather related conditions. Following are limits that may apply to the specified type of chip seal:
  - Minimum ambient air temperature during placement
  - Maximum ambient air temperature during placement
  - Minimum pavement surface temperature during placement
  - Maximum pavement surface temperature during placement
  - Minimum ambient air temperatures for the first 24 hours after placement
  - Placement within 24 hours of rain
  - Placement within 24 hours of forecast rain
  - Placement within 24 hours of freezing temperatures
  - Pavement dampness during placement
  - High wind conditions during placement
- Review the latest weather reports, daily weather forecasts, existing pavement surface temperatures, and ambient air temperatures during the planned shift hours. Document these conditions in your daily report. Have a means established for making contact with the contractor's authorized representative before 4:00 p.m. on the day before the intended workday and discuss conditions forecast for the following workday. Strive to reach mutual agreement on whether work should proceed the following workday. Provide a nonworking day for those days when weather prevents work from proceeding.
- Determine whether the surface to be sealed is clean and dry. Make sure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.

- Examine distributor trucks, chip spreaders, rollers, and other equipment to make sure specifications are met.

4-3702B During the Course of Work

Once work begins, take the following steps:

- Review the weather reports, daily weather forecasts, existing pavement surface temperatures, and ambient air temperatures during the shift hours. Document these conditions on your daily report.
- For the type of chip seal specified, review the contract documents to determine the specifications related to weather. Make sure the contractor places chip seal only under specified weather conditions.
- Obtain the required test report for each truckload of asphaltic emulsion. Compare the report with the specifications. Do not permit the emulsion to be used before testing unless a certificate of compliance accompanies it.
- Make sure both acceptance testing and reporting to the contractor are performed at frequencies listed in Chapter 6-1, "Sample Types and Frequencies," of this manual.
- For chip seals that use a crumb rubber modifier, verify that the contractor submits a Form DOT CEM-4410, "Crumb Rubber Usage Report," monthly and at the end of the project.
- Obtain samples of the asphaltic emulsion in accordance with the frequency tables in Section 6-1, "Sample Types and Frequencies," of this manual. For emulsion used in fog seals, it is preferable to take samples of the emulsion before adding water. If this approach is impractical, note on the sample form how many parts of water were added to how many parts of emulsion.
- From the delivered aggregate material, obtain samples and test them for sieve analysis and cleanness value in accordance with the frequency tables in Section 6-1 of this manual.
- Just before spreading, determine the temperature of the liquid asphalt or emulsion to verify that it falls within the specified range. Note such temperatures in the daily report and also on source documents, if volumetric measurements are to be used to determine pay quantities.
- Just before spreading, review contractor's proposed aggregate and bituminous material spread rates against previously authorized spread rates. If different, but within the contract required range of spread rates, document the contractor's reasoning in the daily report and re-authorize the spread rates.
- For diluted asphaltic emulsion, determine the required spray rate necessary to achieve the residual rate. Refer to Section 4-9403, "During the Course of Work," of this manual for an example of how to determine the spray rate required to achieve a specified residual binder rate. Compare to and document the contractor's equipment spray rate setting in the daily report.

- Obtain the weighmaster certificate for each load of liquid asphalt or emulsion. If the load has been hauled a long distance and job scales are available, it is good practice to weigh the load in using the job scales and, after spreading, to weigh the load out on these same scales.
- Unless the screenings are at the work site and ready to be applied, prohibit the contractor from spreading the emulsion.
- To check the spread rate for asphaltic emulsion, read the tank gauge on the distributor truck and record. Apply materials at the established width and rate for 1,000 feet, or less, if necessary. Monitor the mat over 1,000 feet watching for ridging, plugged tips, and chip density. Read the tank gauge at the end of the 1,000 feet. Calculate and record the overall daily spread rate in the daily report.

Through observation, check that the application of asphaltic emulsion is uniform, both transversely and longitudinally. If the spread does not appear to be uniform, order the correction of spreading equipment. If problems persist, perform ASTM D2995, "Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors," and before allowing the operation to continue, require corrective action.

- Require the contractor to keep the distributor truck close to the chip spreader. Good practice is to place screenings within 30 seconds after the bituminous binder has been spread. Screenings must be placed before setting or "breaking" of the asphaltic emulsion occurs. This setting or breaking is indicated by a change in color from brown to black.
- Determine whether screenings are damp at the time of application, as required in the specifications; when necessary, order wetting.
- Observe the coat of screenings behind the chip spreader. If necessary, order an adjustment in the screening spread rate. Figure 4-37.1 Guidelines for Evaluating Asphalt Quantity and Aggregate Embedment During Chip Sealing shows the desirable quantity of asphalt and void required to correctly embed the aggregate.
- If the chip spreader is moving excessively fast, chips will roll over as they come in contact with the emulsion. As a result, public traffic and roller tires will pick up the chips. If chips are being turned over, check behind the spreader and order a reduced speed.
- Make sure the contractor does not spread the binder and screenings more than 2,500 feet ahead of the initial rolling.
- Check that the contractor performs the rolling in the specified order and required number of roller coverages.
- Verify that the contractor adjusts the spread rate of screenings to prevent pickup by rollers or traffic. However, prohibit a higher spread rate than necessary. Excessive screenings will increase cost and the difficulty of cleanup operations.
- Make sure the contractor discontinues spreading bituminous binder sufficiently early in the shift to permit the termination of traffic control before darkness.

- Check that the contractor performs brooming as specified. Before allowing uncontrolled traffic in adjacent lanes, verify the removal of all loose chips. The most common cause of damage by loose chips results from vehicles in an adjacent lane throwing the chips. During brooming, check that lanes adjacent to chip-sealed lanes remain free of loose screenings. Make sure the contractor maintains the chip seal surface for 4 consecutive days after the day aggregate is applied. During maintenance, order the seal coat to be swept as often as necessary to keep the surface free of loose screenings.
- Decide whether excess screenings should be salvaged and stockpiled or otherwise disposed of, and advise the contractor of the decision. Unless they are economically useful, screenings should not be salvaged.
- Observe the completed application of screenings and order immediate application of additional screenings or clean sand to cover any excess bituminous binder that rises to the surface.
- Review the completed chip seal to determine if it meets the requirements of Section 37-2.01A(4)(c), "Department Acceptance," of the *Standard Specifications*.
- For processing any related damage claims, consult with the district claims officer when the following conditions exist:
  - Damage has been caused by screenings or bituminous binder.
  - The contract contains provisions for deducting funds from contract payments to pay for damage claims.

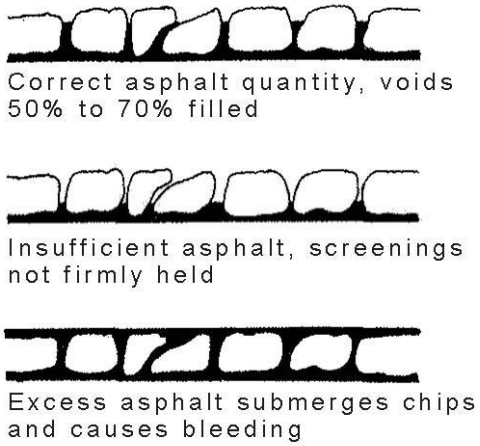

Figure 4-37.1 Guidelines for Evaluating Asphalt Quantity and Aggregate Embedment During Chip Sealing

4-3702C Level of Inspection

Suggested levels of field inspection for typical chip seal activities are:

- Intermittent inspection of sampling and testing of materials.

- Benchmark inspection of equipment to check that it conforms to the specifications.
- Intermittent inspection to verify “No Parking—Tow Away” signs are posted 24 hours before chip seal if affecting public parking.
- Intermittent inspection of existing ambient and pavement temperatures.
- Benchmark inspection of existing facilities, such as valve covers or grates, to make sure all are covered and referenced to relocate after placing chip seal.
- Benchmark inspection of surface preparation of existing pavement surface.
- Intermittent inspection of certificates of compliance for each delivery of asphaltic emulsion or asphalt binder.
- Intermittent inspection of binder application to assure uniformity of application and spread rate.
- Intermittent inspection of aggregate spreading operation to verify uniform application within 10 percent of pre-determined rate.
- Intermittent inspection of finishing operations to verify repair of any ridges, bumps, streaks, or depressions in existing surface.
- Intermittent inspection to verify that required sweeping is performed the day of the chip seal.
- Intermittent inspection to make sure chip sealed areas are maintained for 4 consecutive days and excess aggregate is removed after 4 consecutive days.
- Benchmark inspection of the completed surface to assure it meets the requirements for visual acceptance.
- Benchmark inspection 10 days after completion of maintenance sweeping of the chip seal, to verify that permanent traffic stripes and pavement markings are complete.

4-3702D Quality Control

Guidance for quality control activities included in this section is summarized as follows:

- For chip seals, verify that the contractor performs the quality control sampling and testing at the specified frequency, and reporting within the specified time frame.
- Make sure the contractor submits a copy of the American Association of State Highway and Transportation Officials (AASHTO) accreditation for the laboratory performing the testing of the aggregate screenings and asphaltic emulsion or asphalt binder.
- Verify that the contractor’s authorized laboratory performs the required quality control material sampling and testing at the specified frequency.

- Verify that the contractor submits quality control test results within the specified reporting time.

4-3702E Payment

For measurement and payment, do the following:

- Withhold 50 percent of the estimated value of chip seal work if the contractor fails to place permanent traffic stripes and pavement markings within the specified time.
- Collect weighmaster certificates from each truck as it delivers screenings to the chip spreader. When screenings are stockpiled before spreading, obtain weighmaster certificates for trucks delivering screenings to stockpiles. Determine the weight of unused screenings remaining in stockpiles so that the weight of unused material may be deducted from the delivered weight. From the weight of screenings to be paid for, do not deduct the weight of excess screenings removed from the roadway and disposed of.
- Collect weighmaster certificates and "weigh-back" slips for trucks delivering asphaltic emulsion or liquid asphalt. When additional water is added to asphaltic emulsion, calculate the amount to be deducted from the original weight, using the ratio in the original mix of asphaltic emulsion to water.

For compensation adjustment for price index fluctuations for asphaltic emulsion, refer to Section 9-1.07, "Payment Adjustments for Price Index Fluctuations," of the *Standard Specifications* and perform the following:

- Verify that the contractor has not opted out of payment adjustments for price index fluctuation at the time of bid.
- Process a change order to allow for payment increases and decreases.
- Calculate on a monthly basis the amount of asphalt used in asphaltic emulsion or polymer modified emulsion including flush coat.
- Calculate a paving asphalt adjustment if the California Statewide Crude Oil Index for the current month has fluctuated more than the specified amount from the same index for the month the bid opening occurred. Include the asphalt price adjustment in the monthly estimate.

4-3703 Slurry Seal

The following covers the duties required throughout each phase of the project for slurry seal.

4-3703A Before Work Begins

Before work begins, take the following steps:

- A minimum of 10 days before starting slurry seal activities, verify that the contractor submits the names of proposed authorized laboratories for quality control testing. Authorize the laboratories based on the requirements of Section 37-1.01D, "Quality Assurance," of the *Standard Specifications*. Authorized

laboratories must be able to perform International Slurry Surfacing Association tests and mix design.

- A minimum of 15 days before starting placement of slurry seal, verify that the contractor submits:
  1. Samples of the aggregate.
  2. Samples of asphaltic emulsion or polymer modified asphaltic emulsion.
  3. Asphaltic emulsion or polymer modified asphaltic emulsion data.
  4. Contractor's aggregate test results.
- A minimum of 10 days before the preconstruction meeting, make sure the contractor submits a list of participants in the preconstruction meeting, including the participants' names, employer, titles, and roles in the production and placement of the chip seal. Hold the preconstruction meeting a minimum of 5 days before the start of the chip seal work.
- Hold the preconstruction meeting a minimum of 5 days before the start of the slurry seal. At the preconstruction meeting, discuss the contractor's quality control program and method for performing each element of work affecting material quality. The following items should be discussed:
  1. Frequency of quality control sampling and testing that meets or exceeds specification requirements listed Section 37-1.01D, "Quality Assurance," of the *Standard Specifications*.
  2. Time and frequency of submitting test results.
  3. Responsibilities of quality control laboratories.
- Verify that Form DOT CEM-3101, "Notice of Materials to Be Used," includes slurry seal materials. Refer to Section 6-202, "Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products," of this manual for additional information.
- A minimum of 10 days before starting slurry seal, check that the contractor submits laboratory report of test results and the proposed mix design signed by an authorized laboratory.
- Review the mix design and laboratory tests from the contractor. After determining that the mix design and test results conform to the requirements in Section 37-3.02B(5), "Slurry Seal Mix Design," of the *Standard Specifications*, authorize the mix design.
- Verify that the aggregate material source complies with Section 7-103H (2), "Surface Mining and Reclamation Act," of this manual.
- Obtain the name of the laboratory authorized to perform International Slurry Surfacing Association tests and mix design.
- Obtain initial samples of the aggregate and test the aggregate for the specified quality characteristics. Advise the contractor of the test results.

- Examine the surface to be sealed. Prepare a change order to provide for any necessary corrective action, such as sealing cracks and repairing failed areas. At this stage, a joint review with the maintenance region manager or area superintendent would be helpful.
- Examine the proposed mixing equipment to assure compliance with the specifications. Mixer-spreader trucks must be calibrated for each material source in accordance with the Caltrans *MPQP*. Request assistance from the district weights and measures coordinator for calibrating and checking the accuracy of weighing and metering devices.
- Discuss with the contractor the proposed operation, and determine the method for measuring the weight of aggregate and asphaltic emulsion.
- Review weather reports, daily weather forecasts, existing pavement surface temperatures, and ambient air temperatures during the planned shift hours. Document the temperatures in the daily report. Review existing and forecast conditions to make sure slurry seals are placed when:
  1. The pavement and air temperatures are at least 50 degrees Fahrenheit or more.
  2. The expected high temperature within the 24 hours following placement will be at least 65 degrees Fahrenheit and not below 36 degrees Fahrenheit.
  3. Rain is not imminent.
- Have a means established for making contact with the contractor's authorized representative near the end of the work shift on the day before the intended workday and discuss conditions forecast for the following workday. Strive to reach mutual agreement whether planned work should proceed for the following workday. Agree on a nonworking day when weather prevents work from proceeding.
- Determine whether the surface to be sealed is clean and dry. Make sure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.
- Review the project to determine all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.
- Review the contractor's proposed application rates.
- Verify that contractor covers valve and monument covers, grates, and other exposed facilities within the area of application using plastic or oil-resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after application of the slurry seal.
- Verify that contractor posts "No Parking—Tow Away" signing a minimum of 24 hours before placing chip seal if chip seal affects public parking.

4-3703B During the Course of Work

Once work begins, take the following steps:

- Verify that both acceptance testing and reporting to the contractor are performed at frequencies listed in Section 6-1, “Sample Types and Frequencies,” of this manual.
- If required under the contract, make sure the pavement surface to be treated has been coated with the specified asphaltic emulsion. Advise the contractor of the exact application rate and water amount to be added.
- Obtain the required test report for each truckload of asphaltic emulsion. Compare the report with the specifications. Do not permit the emulsion to be used before testing unless a certificate of compliance accompanies it.
- Before mixing, take samples of the aggregate for testing.
- If the results of grading or sand equivalent tests fail to meet the specifications, order the removal of the slurry seal represented by the failing tests. When the contractor requests in writing that the material remain in place, decide whether to reject the represented material or to allow it to remain in place. If you allow the material to remain in place, your decision must be based on the results of a physical examination of the slurry seal. Look for evidence of bleeding, raveling, stripping, or other deficiencies. Notify the contractor in writing of your decision. Also, if you allow the material to remain in place, calculate the deduction based on the amount of material represented by the failing test result, and deduct the amount from future progress payments.
- Observe the mixing operation to make sure the ordered proportions are being used.
- To determine the bitumen ratio and uniformity of mixing, submit samples of the completed mix to the district laboratory. Place samples in tightly closed containers to prevent moisture loss before testing.
- Make the necessary measurements and calculations to verify that the contractor spreads the slurry seal at the ordered rate.
- As specified, ask the contractor to protect fresh slurry seal from traffic damage. To protect the fresh slurry seal, sand may be applied to the surface at intersections and driveways as specified.
- Review the completed slurry seal to determine if it meets the requirements of Section 37-3.01A(4)(c), “Department Acceptance,” of the *Standard Specifications*.

4-3703C Level of Inspection

Suggested levels of field inspection for typical slurry seal activities are:

- Intermittent inspection to verify that slurry seal ingredients are proportioned in compliance with the authorized mix design.

- Benchmark inspection to verify that truck mounted spreader or continuous self-loading mixer spreader have been calibrated and comply with the *MPQP*.
- Intermittent inspection to check that when truck mounted spreaders are used, a minimum of two operational spreaders are at the job site during placement.
- Intermittent inspection including sampling and testing of materials.
- Intermittent inspection to verify that "No Parking—Tow Away" signs are posted 24 hours before slurry seal application if public parking will be affected.
- Benchmark inspection of existing surface immediately before placing slurry seal to make sure it meets the surface preparation requirements.
- Benchmark inspection to verify that all existing facilities are covered and referenced before placement of slurry seal.
- Intermittent inspection of existing ambient temperature, pavement temperature, and 24-hour weather forecasts for imminent rain or temperatures below 36 degrees Fahrenheit.
- Intermittent inspection to check that each delivery of asphaltic emulsion or polymer modified asphaltic emulsion has a certificate of compliance.
- Intermittent inspection to make sure that within 4 hours of placement, slurry seal has set enough to allow traffic on it without exhibiting distress.
- Intermittent inspection of the completed slurry seal application to make sure irregularities such as scratch or tear marks do not exceed allowable amount.
- Benchmark inspection of the completed surface to verify that it meets the requirements for visual acceptance.
- Intermittent inspection to verify that slurry seal areas are swept 24 hours after placement without damaging the surface, and that sweeping continues for the 4 days afterward, unless deemed not necessary by the engineer.
- Benchmark inspection of slurry seal area 15 days after placement to make sure any areas with bleeding, raveling, separation, or other distresses are repaired.

4-3703D Quality Control

Guidance for quality control activities for slurry seals is summarized as follows:

- For slurry seals, check that the contractor performs the quality control sampling and testing at the specified frequency and reporting within the specified time frame.
- Verify that the contractor submits a copy of the AASHTO accreditation for the laboratory performing the testing of the aggregate and asphaltic emulsion.
- Verify that the contractor's authorized laboratory performs the required quality control material sampling and testing at the specified frequency.
- Make sure contractor submits quality control test results within the specified maximum reporting time.

4-3703E Payment

For measurement and payment, do the following:

- The quantity of slurry seal to be paid for is the combined quantity of asphaltic emulsion and aggregate. Because of the type of equipment used and the nature of the slurry seal operation, it is usually impossible to weigh both components together. Separately determine the mass of asphaltic emulsion and aggregate, and add the two results to determine the pay quantity.
- As necessary to determine pay quantities, collect weighmaster certificates for aggregate and asphaltic emulsion. Use properly sealed and calibrated metering devices to determine pay quantities. When converting volume measurements of asphaltic emulsion to mass, make the appropriate corrections for temperature.
- When slurry seal is allowed to remain in place even though it failed the grading or sand equivalent tests, make the appropriate administrative deduction.

For compensation adjustment for price index fluctuations for slurry seal refer to Section 9-1.07, "Payment Adjustments for Price Index Fluctuations," of the *Standard Specifications* and perform the following:

- Verify that the contractor has not opted out of payment adjustments for price index fluctuation at the time of bid.
- Process a change order to allow for payment increases and decreases.
- Calculate on a monthly basis the amount of asphalt used in slurry seal polymer modified emulsion.
- Calculate a paving asphalt adjustment if the California Statewide Crude Oil Index for the current month has fluctuated more than the specified amount from the same index for the month the bid opening occurred. Include the asphalt price adjustment in the monthly estimate.

4-3704 Micro-Surfacing

The following sections cover the duties required throughout each phase of the project for micro-surfacing.

4-3704A Before Work Begins

Before work begins, take the following steps:

- A minimum of 10 days before starting micro-surfacing activities, make sure the contractor submits the names of proposed authorized laboratories for quality control testing. Authorize the laboratories based on the requirements of Section 37-1.01D, "Quality Assurance," of the *Standard Specifications*.
- A minimum of 15 days before starting placement of micro-surfacing, make sure the contractor submits:
  - Samples of the aggregate.
  - Samples of polymer modified asphaltic emulsion.

    - Polymer modified asphaltic emulsion data.
    - Contractor's aggregate test results.
- A minimum of 10 days before the preconstruction meeting, verify that contractor submits a list of participants in the preconstruction meeting, including the participants' names, employer, title, and role in the production and placement of the micro-surfacing.
- Hold the preconstruction meeting a minimum of 5 days before the start of the micro-surfacing work. At the preconstruction meeting discuss the contractor's quality control program and method for performing each element of work affecting material quality. The following items should be discussed:
    - Frequency of quality control sampling and testing that meets or exceeds specification requirements listed in the quality control sections of the *Standard Specifications*.
    - Time and frequency of submitting test results.
    - Responsibilities of quality control laboratories.
- Verify that Form DOT CEM-3101, "Notice of Materials to Be Used," includes micro-surfacing materials. Refer to Section 6-202, "Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products," of this manual for additional information.
- Obtain the name of the laboratory authorized to perform International Slurry Surfacing Association tests for mix design.
- Review the mix design and laboratory tests submitted by the contractor before start of the placement. The mix design report should include comparison of each material's test result to the specification requirements. If the mix design and test results conform to the requirements in Section 37-3.03B(5), "Micro-Surfacing Mix Designs" of the *Standard Specifications*, authorize the mix design.
- Verify that the aggregate material source complies with Section 7-103H (2), "Surface Mining and Reclamation Act," of this manual.
- Obtain the name of the authorized laboratory in charge of laboratory report and mix design testing.
- Obtain initial samples of the aggregate, and test for the specified quality characteristics. Advise the contractor of the test results.
- Obtain the name of the contractor's authorized representative responsible for communicating about unsuitable weather that prevents micro-surfacing operations.
- Examine the surface to be sealed. Prepare a change order to provide for any necessary corrective action, such as sealing cracks and repairing failed areas. At this stage, a joint review with the Maintenance region manager or area superintendent would be helpful.

- Examine the proposed mixing equipment to verify compliance with the specifications. Mixer-spreader trucks must be calibrated for each material source in accordance with the Caltrans *MPQP*. Verify equipment *MPQP* certification or request assistance from the district weights and measures coordinator for calibrating and checking the accuracy of weighing and metering devices.
- Discuss with the contractor the proposed operation, and determine the method for measuring the weight of aggregate and asphaltic emulsion.
- Determine whether the surface to be sealed is clean and dry. Make sure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.
- Review the project to ascertain all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.
- Advise the contractor of the exact spread rate to be used.

4-3704B During the Course of Work

Once work begins, take the following steps:

- Verify that both acceptance testing and reporting to the contractor are performed at frequencies listed in Section 6-1, “Sample Types and Frequencies,” of this manual.
- Obtain the required test report for each truckload of micro-surfacing asphaltic emulsion. Compare the report with the specifications. Do not permit the emulsion to be used before testing unless a certificate of compliance accompanies it.
- Before mixing, take samples of the aggregate for testing.
- If the results of grading or sand equivalent tests fail to meet the specifications, order the removal of the micro-surfacing represented by the failing tests. When the contractor requests in writing that the material remain in place, decide whether to reject the represented material or to allow it to remain in place. A decision to allow the material to remain in place must be based on the results of a physical examination of the micro-surfacing. Look for evidence of bleeding, raveling, stripping, or other deficiencies. Notify the contractor in writing of the decision. Also, if the material is allowed to remain in place, calculate the deduction based on the amount of material represented by the test result, and deduct the amount from future progress payments.
- Observe the mixing operation to make sure the ordered proportions are being used.
- To determine the bitumen ratio and uniformity of mixing, submit samples of the completed mix to the district laboratory. Place samples in tightly closed containers to prevent moisture loss before testing.
- Make the necessary measurements and calculations to make sure the contractor spreads the micro-surfacing at the ordered rate.

- Review the completed micro-surfacing to determine if it meets the requirements of Section 37-3.03A(4)(c), "Department Acceptance," of the *Standard Specifications*.

4-3704C Level of Inspection

Suggested levels of field inspection for typical micro-surfacing activities are:

- Benchmark inspection to verify that a required test strip is constructed if the micro-surfacing placement will require more than 1 day to complete.
- Intermittent inspection to verify that micro-surfacing ingredients are proportioned in compliance with the authorized mix design.
- Benchmark inspection to check that truck mounted spreader or continuous self-loading mixer spreader have been calibrated and comply with the *MPQP*.
- Intermittent inspection to make sure that when truck mounted spreaders are used, that a minimum of two operational spreaders are at the job site during placement.
- Intermittent inspection including sampling and testing of materials.
- Intermittent inspection to verify that "No Parking—Tow Away" signs are posted 24 hours before micro-surfacing if public parking will be affected.
- Intermittent inspection of existing surface immediately before placement of micro-surfacing to assure it meets the surface preparation requirements.
- If there is a bid item for tack coat, benchmark inspection to verify that tack coat is applied at the authorized rate for micro-surfacing.
- Benchmark inspection to make sure all existing facilities are covered and referenced before placement of micro-surfacing.
- Intermittent inspection of existing ambient temperature, pavement temperature, and 24-hour weather forecasts of imminent rain or temperatures below 36 degrees Fahrenheit.
- Intermittent inspection to verify that all deliveries of micro-surfacing emulsion have a certificate of compliance.
- Intermittent inspection to assure that within 2 hours of placement, micro-surfacing has set enough to allow traffic on it without exhibiting distress.
- Benchmark inspection of the completed surface to make sure it meets the requirements for visual acceptance.
- Intermittent inspection to verify that micro-surfacing areas are swept 24 hours after placement without damaging the surface, and that sweeping continues for the 4 days after, unless deemed not necessary by the engineer.
- Benchmark inspection of slurry seal area 15 days after placement to make sure any areas with bleeding, raveling, separation, or other distresses are repaired.

4-3704D Quality Control

Guidance for quality control activities for micro-surfacing are summarized as follows:

- For micro-surfacing, make sure the contractor performs the quality control sampling and testing at the specified frequency and reports results within the specified time frame.
- Verify that the contractor submits a copy of the AASHTO accreditation for the laboratory performing the testing of the aggregate and asphaltic emulsion.
- Check that the contractor's authorized laboratory performs the required quality control material sampling and testing at the specified frequency.
- Verify that contractor submits quality control test results within the specified maximum reporting time.

4-3704E Payment

For measurement and payment, do the following:

- The quantity of micro-surfacing to be paid for is the combined quantity of asphaltic emulsion and aggregate. Because of the type of equipment used and the nature of the micro-surfacing operation, it is usually impossible to weigh both components together. Separately determine the mass of asphaltic emulsion and aggregate, and add the two results to determine the pay quantity.
- As necessary to determine pay quantities, collect weighmaster certificates for aggregate and asphaltic emulsion. You may use properly sealed and calibrated metering devices to determine pay quantities. When converting volume measurements of asphaltic emulsion to mass, make the appropriate corrections for temperature.
- When micro-surfacing is allowed to remain in place even though it failed the grading or sand equivalent tests, make the appropriate administrative deduction.

For compensation adjustment for price index fluctuations for micro-surfacing seal refer to Section 9-1.07, "Payment Adjustments for Price Index Fluctuations," of the *Standard Specifications* and perform the following:

- Verify that the contractor has not opted out of payment adjustments for price index fluctuation at the time of bid.
- Process a change order to allow for payment increases and decreases.
- Calculate on a monthly basis the amount of asphalt used in micro-surfacing emulsion.
- Calculate a paving asphalt adjustment if the California Statewide Crude Oil Index for the current month has fluctuated more than the specified amount from the same index for the month the bid opening occurred. Include the asphalt price adjustment in the monthly estimate.

4-3705 Fog Seals and Flush Coats

The following sections cover the duties required throughout each phase of the project for fog seals and flush coats.

4-3705A Before Work Begins

- A minimum of 10 days before starting fog seal or flush coat activities, make sure the contractor submits the names of proposed authorized laboratories for quality control testing. Authorize the laboratories based on the requirements of Section 37-1.01D, "Quality Assurance," of the *Standard Specifications*.
- A minimum of 15 days before starting placement of fog seal, check that the contractor submits either items 1 and 2 for fog seals or items 1 through 4 for flush coats:
  1. Samples of asphaltic emulsion.
  2. Asphaltic emulsion supplier, type and grade of asphaltic emulsion and copies of specified test results for asphaltic emulsion.
  3. Proposed target *x* values for sand gradation.
  4. Gradation test results for sand.
- A minimum of 10 days before the preconstruction meeting, make sure the contractor submits a list of participants in the preconstruction meeting, including the participants' names, employer, title, and role in the production and placement of the fog seal or flush coat.
- Hold the preconstruction meeting a minimum of 5 days before the start of the fog seal or flush coat. At the preconstruction meeting discuss the contractor's quality control program and method for performing each element of work affecting material quality. The following items should be discussed:
  - Frequency of quality control sampling and testing that meets or exceeds specification requirements listed in the quality control sections of the *Standard Specifications*
  - Time and frequency of submitting test results
  - Responsibilities of quality control laboratories

4-3705B During the Course of Work

- Verify that both acceptance testing and reporting to the contractor are performed at frequencies listed in Section 6-1, "Sample Types and Frequencies," of this manual.
- Review weather reports, daily weather forecasts, existing pavement surface temperatures, and ambient air temperatures during the shift hours. Document conditions in the daily report.
- Verify that "No Parking—Tow Away" signs are posted 24 hours before placement of fog seal or flush coat if public parking will be affected.

- Review the contract documents to determine the specifications related to weather. Make sure the contractor places fog seal or flush coat only under specified weather conditions.
- For fog seal or flush coat, the contractor decides the grade of slow setting or quick setting emulsion and on the dilution rate. The quantity of water added for dilution must be based on the judgment and experience of field personnel, but in all cases must result in a residual rate within the specified range. When determining the application rate, take into account the permeability of the surface to be sealed, climatic conditions anticipated at the time of application, traffic, cross slope and profile grade. Based on the delivered state of the asphaltic emulsion binder (diluted or undiluted), determine the spray rates required to achieve both the specified minimum and maximum residual rates. Verify that the contractor sprays within that range of rates. Refer to Section 4-9403, "During the Course of Work," of this manual for examples of how to determine the spray rate required to achieve a specified residual rate.
- For flush coat, authorize contactor's sand application rate when it falls within the specified range.
- For flush coat, make sure contractor spreads sand using a mechanical device immediately after application of the emulsion using a mechanical device that spreads at a uniform rate over the full width of a traffic lane in a single application.
- For flush coat, make sure contractor sweeps loose sand material remaining on the surface 24 hours after application.
- Review the completed fog seal to determine if it meets the requirements of Section 37-4.02A(4)(c), "Department Acceptance," of the *Standard Specifications*.
- Review the completed flush coat to determine if it meets the requirements of Section 37-4.03A(4)(c), "Department Acceptance," of the *Standard Specifications*.

4-3705C Level of Inspection

Suggested levels of field inspection for typical fog seal and flush coat activities are:

- Intermittent inspection including sampling and testing of materials.
- Intermittent inspection to verify that "No Parking—Tow Away" signs are posted 24 hours before application of fog seal or flush coat if public parking is affected.
- Benchmark inspection of existing surface immediately before placement of fog seal or flush coat to assure it meets the surface preparation requirements.
- Intermittent inspection of existing temperature and weather conditions to make sure placement of fog seal or flush coat occurs only above minimum pavement and ambient temperature requirements.

- Intermittent inspection to assure fog seal or flush coat placement does not occur within 24 hours of rain, or within 24 hours of predicted rain or freezing temperatures.
- Intermittent inspection of certificates of compliance for each delivery of asphaltic emulsion.
- Intermittent inspection to verify that asphaltic emulsion for fog seal or flush coat is applied within the specified residual range and asphaltic emulsion for fog seal is not diluted with more than 1 part water to 1 part original emulsion.
- Intermittent inspection to assure asphaltic emulsion for fog seal or flush coat is applied with uniform coverage.
- Intermittent inspection to check that sand for flush coat is applied within the specified range and immediately after application of asphaltic emulsion.
- Benchmark inspection to make sure loose sand is swept from flush coat areas 24 hours after application.
- Benchmark inspection of the completed surface to check that it meets the requirements for visual acceptance.

4-3705D Quality Control

Guidance for quality control activities for fog seal and flush coat are summarized as follows:

- For fog seal and flush coat, make sure the contractor performs the quality control sampling and testing at the specified frequency and reports results within the specified time frame.
- Verify that the contractor submits a copy of the AASHTO accreditation for the laboratory performing the testing of the aggregate and asphaltic emulsion.
- Verify that the contractor's authorized laboratory performs the required quality control material sampling and testing at the specified frequency.
- Check that the contractor submits quality control test results within the specified maximum reporting time.

4-3705E Payment

- For flush coats, collect weighmaster certificates from each delivery of sand. Determine the weight of unused sand so that the weight of unused material may be deducted from the delivered weight. For the weight of sand to be paid for, do not deduct the weight of sand swept from the roadway.
- For fog seals and flush coats, collect weighmaster certificates and "weigh-back" slips for trucks delivering asphaltic emulsion. When additional water is added to asphaltic emulsion, calculate the amount to be deducted from the original weight, using the ratio in the original mix of asphaltic emulsion to water.
- For flush coats, collect weighmaster certificates from each delivery of sand. Determine the weight of unused sand remaining in stockpiles so that the weight

of unused material may be deducted from the delivered weight. From the weight of sand to be paid for, do not deduct the weight of excess screenings removed from the roadway and disposed of.

For compensation adjustment for price index fluctuations of asphaltic emulsion, refer to Section 9-1.07, "Payment Adjustments for Price Index Fluctuations," of the *Standard Specifications* and perform the following:

- Verify that the contractor has not opted out of payment adjustments for price index fluctuation at the time of bid.
- Process a change order to allow for payment increases and decreases.
- Calculate on a monthly basis the amount of asphalt used in asphaltic emulsion or polymer modified emulsion including flush coat.
- Calculate a paving asphalt adjustment if the California Statewide Crude Oil Index for the current month has fluctuated more than the specified amount from the same index for the month the bid opening occurred. Include the asphalt price adjustment in the monthly estimate.

4-3706 Parking Area Seal

The following covers the duties required throughout each phase of the project for parking area seal.

4-3706A Before Work Begins

Before work begins, take the following steps:

- A minimum of 15 days before starting parking area seal, make sure contractor submits a 20-pound sample of the aggregate to be used.
- A minimum of 10 days before starting parking area seal, make sure the contractor submits:
  1. The name of proposed laboratory to perform mix design.
  2. For both new and substitute mix designs, laboratory report of test results and proposed mix design. Verify that the report of test results includes the specific materials to be used and shows a comparison of test results and specifications.
  3. Check that the mix design report includes the quantity of water that may be added at the job site.
  4. Manufacturer's data for oil seal and polymer.
  5. Verify that the test reports are signed by an authorized laboratory.
- A minimum of 10 days before the preconstruction meeting, make sure the contractor submits a list of participants in the preconstruction meeting, including the participants' names, employer, title, and role in the production and placement of the parking area seal.

- Hold the preconstruction meeting a minimum of 5 days before the start of the parking area seal. At the preconstruction meeting, discuss the contractor's quality control program and method for performing each element of work affecting material quality. The following items should be discussed:
  1. Frequency of quality control sampling and testing that meets or exceeds specification requirements listed in the quality control sections of the *Standard Specifications*.
  2. Time and frequency of submitting test results.
  3. Responsibilities of quality control laboratories.
- Obtain the name of the authorized laboratory in charge of testing at least 10 days before the start of the placement.
- Obtain initial samples of the aggregate samples 15 days before starting the placement.
- Obtain test results and mix design at least 7 days before the placement.
- Review the mix design and laboratory tests submitted by the contractor before start of the placement. The mix design report should include comparison of each material's test result to the specification requirements. If the mix design and test results conform to the requirements in Section 37-5.02, "Materials" of the *Standard Specifications*, authorize the mix design.
- Verify that Form DOT CEM-3101, "Notice of Materials to Be Used," includes seal materials. Refer to Section 6-202, "Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products," of this manual for additional information.
- Examine the surface to be sealed. Prepare a change order to provide for any necessary corrective action, such as sealing cracks and repairing failed areas. At this stage, a joint review with the Maintenance region manager or area superintendent would be helpful.
- Discuss with the contractor the proposed operation, and determine the method for measuring the weight of aggregate and asphaltic emulsion.
- Determine whether the surface to be sealed is clean and dry. Make sure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.
- Verify that all the utility inlets are covered with heavy paper or roofing felt adhered to the surface of the inlet.
- Review the project to ascertain all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.

4-3706B During the Course of Work

During the course of work, take the following steps:

- Obtain the required test report for each truckload of parking area seal. Compare the report with the specifications. Do not permit the seal to be used before testing unless a certificate of compliance accompanies it.
- Check that the pavement surface to be treated has been dampened.
- Verify that a certificate of compliance accompanies each load of parking area seal.
- To determine the bitumen ratio and uniformity of mixing, submit samples of the undiluted parking area seal material to the district laboratory. Place samples in tightly closed containers to prevent moisture loss before testing.
- Verify that acceptance testing and reporting to the contractor are performed at frequencies listed in Section 6-1, “Sample Types and Frequencies,” of this manual.

4-3706C Level of Inspection

Suggested levels of field inspection for parking area seal activities are:

- Benchmark inspection to verify that parking area seal mixture conforms to the approved mix design.
- Intermittent inspection including sampling and testing of materials.
- Intermittent inspection to verify that “No Parking—Tow Away” signs are posted 24 hours before application of parking area seal if public parking will be affected.
- Intermittent inspection to assure that any irrigation systems adjacent the parking area seal have been shut off for 24 hours after placement of the seal.
- Intermittent inspection of existing surface immediately before placement of parking area seal to assure it meets the surface preparation requirements, including the sealing of any oil and grease spots that remain after cleaning.
- Intermittent inspection of certificates of compliance for each delivery of asphaltic emulsion used in the parking area seal mixture.
- Intermittent inspection to check that parking area seal is applied uniformly and smoothly, and free of ridges or uncoated areas.
- Intermittent inspection to verify that water added to the parking area seal mixture conforms to the manufacturer’s recommendations, and that added water does not exceed by 15 percent the volume of undiluted emulsion.
- Intermittent inspection to make sure that if placing in multiple applications, the previous application has thoroughly dried before repeating the application.
- Intermittent inspection to verify that contractor keeps traffic off parking area seals for at least 24 hours.
- Intermittent inspection to make sure striping or pavement markings are only applied when the surface is dry.

- Benchmark inspection of the completed surface to assure it meets the requirements for visual acceptance.

4-3706D Quality Control

Guidance for quality control activities for parking area seal is summarized as follows:

- For parking area seal, make sure the contractor performs the quality control sampling and testing at the specified frequency and reports results within the specified time frame.
- Verify that the contractor submits a copy of the AASHTO accreditation for the laboratory performing the testing.
- Check that the contractor's authorized laboratory performs the required quality control material sampling and testing at the specified frequency.
- Make sure the contractor submits quality control test results within the specified maximum reporting time.

4-3706E Payment

For measurement and payment, do the following:

- The quantity of parking seal to be paid for is the combined weight of asphaltic emulsion and aggregate without added water and set-control additive. Because the materials are mixed at a plant, it is important to have a proportioning record from the plant.
- As necessary to determine pay quantities, collect weighmaster certificates for aggregate and asphaltic emulsion. You may use properly sealed and calibrated metering devices to determine pay quantities. When converting volume measurements of asphaltic emulsion to mass, make the appropriate corrections for temperature.

For compensation adjustment for price index fluctuations for parking area seal, refer to Section 9-1.07, "Payment Adjustments for Price Index Fluctuations," of the *Standard Specifications*, and do the following:

- Verify that the contractor has not opted out of payment adjustments for price index fluctuation at the time of bid.
- Process a change order to allow for payment increases and decreases.
- Calculate on a monthly basis the amount of asphalt used in the asphaltic emulsion in the parking area seal.
- Calculate a paving asphalt adjustment if the California Statewide Crude Oil Index for the current month has fluctuated more than the specified amount from the same index for the month the bid opening occurred. Include the asphalt price adjustment in the monthly estimate.

4-3707 Crack Treatment

The following covers the duties required throughout each phase of the project for crack treatment.

4-3707A Before Work Begins

Before work begins, take the following steps:

- Verify that Form DOT CEM-3101, "Notice of Materials to Be Used," includes crack treatment materials. Refer to Section 6-202, "Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products," of this manual for additional information.
- Verify the receipt of a certificate of compliance for each load of crack treatment material if it is on the Authorized Materials List. If the crack treatment material is not on the Authorized Materials List, obtain samples and authorized laboratory test results 20 days before use.
- Obtain the name of the laboratory authorized to perform material testing.
- Review laboratory tests from the contractor and determine if the material test results conform to the requirements in Section 37-5.02, "Materials," of the *Standard Specifications*. Advise the contractor of the test results.
- Examine the proposed equipment to verify compliance with the specifications and discuss with the contractor the proposed operation.
- Determine whether cracks to be treated are clean and dry. Make sure the contractor cleans the cracks to remove all loose particles of pavement, dirt, and other extraneous material.
- Review the project to ascertain all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.

4-3707B During the Course of Work

During the course of work, take the following steps:

- Verify the receipt of a certificate of compliance for each load of crack treatment material if it is on the Authorized Materials List. Verify that the certificate of compliance includes all required items.
- If crack treatment material is not on the Authorized Materials List, make sure contractor submits test results and samples 20 days before use.
- Verify that each delivery of material includes manufacturer's heating and application instructions, safety data sheet, and manufacturer's recommended detackifying agent.
- Make sure acceptance testing is performed at frequencies listed in Section 6-1, "Sample Types and Frequencies," of this manual.

- For contracts specifying to fill the crack recessed 1/4-inch or flush, check that the contractor removes crack material that is spilled or deposited on the pavement surface.
- For contracts specifying to fill the crack with overband not more than 3 inches wide, check that the contractor removed crack material that is spilled or deposited on the pavement surface outside the 3-inch wide overband limit.
- Observe the application of crack treatment material using approved equipment.
- If the crack treatment is tacky before opening to traffic have the contractor apply sand or the manufacturer's recommended detackifying agent.

4-3707C Level of Inspection

Suggested levels of field inspection for crack treatment activities are:

- Intermittent inspection including sampling and testing of materials.
- Intermittent inspection of certificates of compliance for crack treatment material if listed on the Authorized Materials List.
- Intermittent inspection to verify that "No Parking—Tow Away" signs are posted 24 hours before application of parking area seal if public parking will be affected.
- Intermittent inspection to check that existing cracks have been cleaned with oil-free compressed air at a minimum of 90 pounds per square inch.
- Intermittent inspection to verify that cracks are clean and dry before treating and pavement surface temperature is at least 40 degrees Fahrenheit. If cracks containing moisture are being heated or dried with a hot air lance, make sure the flame is not applied directly to the pavement adjacent to the crack.
- Intermittent inspection to check that hot-applied crack treatment material is applied in accordance with the manufacturer's instructions.
- Intermittent inspection to make sure that cold-applied crack treatment material applied using a distributor kettle meets the requirements.
- Intermittent inspection to verify that the contractor treats tacky crack treatment material with sand or manufacturer's recommended detackifying agent before opening to traffic.
- Intermittent inspection to check that contractor treats cracks on shoulders adjacent to lanes.
- Benchmark inspection of the completed surface to assure it meets the requirements for visual acceptance.

4-3707D Payment

Crack treatment is paid for by lane mile measured along the edge of each paved lane parallel to the pavement centerline and includes crack treatment of the adjacent shoulder.