ASPHALT SURFACE TREATMENT

INSPECTION PROCESS

# INSPECTION

The inspector’s duties are governed by the requirements of the bound copy of the contract, standard specifications, standard drawings, and construction manual. Inspectors keep pay record books, project reports, and perform sampling which are related to the task they have been assigned. The asphalt surface treatment best practices manual and checklist is a valuable reference to equip the inspector with his duties. The contract will include: The proposal, project special provisions, permits, and summary of quantities.

The Contract will provide asphalt type and quantity with tolerances in Gallons per SQ YD and range in +/- Gallons per SQ YD. The Contract will provide the aggregate sizes and quantity with tolerances in Pounds per SQ YD and range in +/- Pounds per SQ YD.

Several groups of people are here to assist you. Material & Test will provide Technicians and Subject Matter Experts. Obtain names and contact information.

## REQUIRED PAPERWORK

 Prior to paving, obtain copies of the following paperwork:

1. **Prior to paving**, Certificate of Compatibility for each Aggregate and Emulsion used on the project.
2. Bill of laden for the emulsion: From the emulsion supplier, weigh master stamp and signature, and gallons delivered. Collected through out project as asphalt deliveries are made
3. Stone tickets for the aggregate are collected daily if aggregate is direct hauled from quarry and as delivered if hauled to stockpile. Type of material, weigh master stamp, and signature are required.
4. Pay record book or Daily Diary for quantities used, length of map, or other important notes.
5. AST Inspector’s Daily Report (Form M-T 660)

PRE-PAVING EXCERCISES

Inspection begins with a visual inspection of the following activities or existing conditions

* Is the roadway clean of any debris, dirt or shoulder material that will prevent bonding?
* Do you have an understanding of how the contractor is going to proceed with work? Staging, equipment locations, traffic control, and overall safety of contractor, traveling public and yourself.
* Does the road to be paved need an adjustment to the emulsion rate due to bleeding (reduced) or cracking or oxidation (increased). Use the tolerances to adjust if needed.
* IS Contractor staging area located in a safe location for the public and contractor forces?
* What is the Surface temperature of existing roadway at time of application?
* What is the forecasted Weather for the day’s activities? Are storms in the forecast?
* Is Temporary Traffic Control in place? See detail drawing RWZ-1 Temporary Traffic Control provided in contract plans. Are all signs in place at all locations on the map to be paved?
* Are flaggers and pilot car in place and in working order? *SAFETY FIRST*
* Is everyone wearing a safety vest?

APPLICATION EQUIPMENT – RATES VERIFIED

**Remember- typically there will be two emulsion and aggregate rates**

**Stone Spreader:** Calibrate the stone spreader. This is typically done at the stockpile or on a gravel lot where aggregate can be left after calibration is complete. Spread a square yard canvas on the ground in front of the spreader head and have the contractor apply a stone pass over the canvas at the estimated rate. Observe aggregate on the canvas for single coverage and then weight the aggregate on the canvas. Adjust if needed. Additional inspection of the aggregate rate will take place at the test section to follow.

**Distributor:** Calibrate the asphalt distributor. This is typically done at a minimum 100-foot Test Section on the roadway. Inspector should measure a minimum 100-foot section at the beginning of the map to be paved by marking the beginning and ending of the section. Do not include the intersection in this test section. The measured length and width will be multiplied to find the square footage in the section. The gallons applied can be zeroed out on the distributor and a shot can be applied. Divide the gallons applied by the squared footage and check rate applied. Adjust if needed. Inspect the emulsion application for uniformity, spray pattern, streaking, puddling, and other problems with the emulsion application.

Once the emulsion rate and uniform application is obtained, apply the aggregate to the test section and observe. Allow the rollers to roll the section. Is there a single rate of aggregate applied? Is the rolling pattern used compacting the aggregate into the emulsion? Does the seal have a majority of the cross-sectional area showing aggregate with emulsion showing around the aggregate? No excessive emulsion or aggregate in the mat.

Provided the test section is adequate, paving can begin.

# CHIP SEAL TREATMENT “TRAIN” CAN BEGIN TO PAVE THE ROAD

The Contractor can begin paving at this point. You should expect to see the train proceed as follows:

* Distributor (SPEC BOOK 600-5 PG 6-1, B.P.M. PG 6)
* Rock Spreader (B.P.M. PG 7, SPEC BOOK 660 PG 6-43)
* Dump Trucks (B.P.M. PG 8)
* Pneumatic Tire Rollers (B.P.M. PG 9, SPEC BOOK 660-8 (A) PG 6-43)
* Steel Wheel Rollers (B.P.M. PG 9, SPEC BOOK 660-8 (A) PG 6-43)
* Combination Roller used in place of steel wheel roller (SPEC BOOK 660-8(A) PG 6-44, B.M.P. PG 10)

## PAVING THE ROADWAY

## During paving, the Inspector should be monitoring the following:

## These activities should be checked periodically and more often if there are any problems with any of the activities involved.

* Is the emulsion in the 160-to-170-degree range? See temperature gauge on distributor.
* Does distributor place a uniform and full width layer of emulsion?
* There should be No corn rows or streaks.
* The emulsion color should be brown in its emulsified state, black after it breaks.
* Bubbles can appear from the emulsifier, and this is normal.
* Remember that smell - Should not smell like diesel fuel.
* Should remain on roadway until stone is placed.
* Are emulsion filling roadway cracks with material left to secure aggregate?
* Know how long emulsion takes to break during the paving season.
* False break: A thin layer over the surface of emulsion looks like it’s broke. The water bottle test can assist with this.
* Good aggregate for chip seals has uniform shape, hardness and clean
* Excessive moisture and “dirty stone” will reduce the bonding
* Dry aggregate causes premature emulsion break: Introduce water if from a stockpile, watch for contamination
* Dry dusty aggregates use spray bars on steel wheel roller
* Ideal condition of aggregate: saturated surface dry
* Are the front and rear hoppers on the rock spreader adequately supplied with aggregate
* Is aggregate placed across the full width of the road?
* Does the mat have that salt and pepper appearance? Emulsion can be seen through aggregate
* Rubber tire roller should roll after stone spreader, with two passes Maintain proper tire pressure. Tires should be smooth (no tread)
* At least one coverage with 5-to-8-ton roller
* Provides finished arrangement of aggregate with one pass
* Do not allow crushing of aggregate
* Use water on steel wheel roller when needed
* Is rolling taking place within 5 minutes
* Exposed emulsion at joints – Lateral and Longitudinal
* Lateral Joints – make sure asphalt emulsion is left exposed when spreader stops 3 to 4 feet
* Distributor should reapply with in this uncovered layer when spreader starts up

INSPECTOR ACTIVITIES DURING PAVING Continued

* Longitudinal Joints – 2 to 3 inches of emulsion should be left exposed at longitudinal joint
* Distributor and Spreader will cover this when adjacent lane is paved.
* Watch for piles of aggregate especially on bottom layer
* Watch for excessive material at intersections
* Rates should be uniform
* Traffic being maintained - stay off section until set.
* Traffic Control and Safety being maintained
* Construction vehicle management – one lane open for public
* Speed through work zone
* All ground personnel watch for traveling public and equipment
* Dust Control: Respirators for operators, sight distance for the public
* **A GOOD Rule to remember: Keep your rock spreader close and your rollers closer**

## INTERSECTIONS

* Main line of intersection pulled by distributor
* Irregular areas shot with hand wand
* Traffic Control at intersections can be tricky. Make sure contractor has accounted for all turning traffic and ground forces working in intersection.

## CHECK ASPHALT AND STONE RATES SAMPLING

* Remember that M&T personnel can be your friend
* If something doesn’t look right IT ISN’T. AST operations can be sensitive because of all the variables associated with the process. Call your Subject Matter Experts for help.
* The Engineer has the ability to sample emulsion and aggregate

KEEP GOOD NOTES (FOR YOUR SAKE)

* Keep a field book in vest pocket
* Be observant and take pictures.
* Keep your project in order the best you can
* Turn in all asphalt and stone tickets ASAP
* The inspector’s measurements should be accurate and legible for pay quantities
* Are emulsion tickets per SPEC BOOK 1020-1, PG 10-44
* Aggregate tickets per CONST MANUAL, PG R-165, SPEC BOOK, PG 10-45

INSPECTOR ACTIVITIES CONCLUSION OF PAVING

These activities will be performed a few days after paving:

* Be a good neighbor. Sweeping activities will generate some loose aggregate on the shoulders. Be careful where this material is left and avoid excessive piles in yards and driveways.
* If rates were not taken into consideration during paving, problems will occur here.
* Some contracts use vacuum trucks
* Remember good house keeping
* Down pressure or early sweeping can remove aggregate from the seal.

FOG SEALS

* Typically, NOT done during the original paving process
* 3 to 5 days after the AST paving
* See contract for application rates
* Loose Aggregate must be removed prior to application
* Traffic control as before with addition of cones to prevent traffic from running on seal
* Watch for prevailing winds
* Traffic must stay off seal until dry

# CHIP SEAL TREATMENT – ISSUES

Four Main Categories

**Excessive emulsion- Bleeding**

* Rate too high
* Insufficient or dirt aggregate
* Existing road bleeding
* Leaking bars, nozzles distributor
* Over application from hand wand
* Improper spray bar height

**Excessive aggregate - Raveling**

* Aggregate rate too high
* Insufficient emulsion
* Excessive overlap or spillage
* Improper rolling
* Aggregate with no emulsion under it
* Stone piles

**Insufficient emulsion**

* Cold emulsion
* Wrong nozzle angle
* Wrong rate applied
* Wrong spray bar height
* Nozzles clogged

**Insufficient aggregate**

* Wrong rate
* Dirty aggregate
* Clogged spreader gates
* Spreader gates not set correct
* Spreader hopper not supplied with aggregate

**These can be caused by:**

* Human error
* Equipment malfunctions
* Materials
* Pick aggregate from mat to check for emulsion break
* Humidity: Too high in the summer, too low in the fall
* Rain on seals not cured: loss of emulsion onto the shoulder or road turned brown
* Retained moisture in fall, trapped water freezes (Shelling)
* AST seals all are affected by the weather and elevation