

..... DIVISION  
**INSPECTION-IN-DEPTH  
ASPHALT PAVEMENTS**

**PROJECT DATA:**

Project Number:  
County:  
Inspection Made By:  
In Company With:  
Date of Inspection:  
Percent of Work Completed:  
Percent Time Elapsed:  
Contractor:  
Contract Amount:

**References:**

1. 1995 Standard Specifications
2. 2000 Quality Assurance Program for Hot Mix Asphalt and Concrete Pavements
3. MP 401.02.22 (as part of the 401 special provision)
4. MP 401.02.23 (as part of the 401 special provision)
5. MP 401.03.50 (as part of the 401 special provision)
6. MP 401.05.20 (as part of the 401 special provision)
7. Applicable Special Provisions
8. Hot-Mix Bituminous Paving Manual, Federal Highway Administration
9. Hot-Mix Asphalt Paving Handbook, US Army Corps of Engineers
10. Hot Mix Asphalt Construction, Participant Manual for NHI Course 13132

**Scope of Work:**

This guideline was prepared utilizing the above mentioned references. The checks included in the guidelines are considered to be the major items and can be supplemented as deemed necessary by the inspecting party. The Area Engineer is provided the flexibility of using the guideline in its entirety or portions depending on the job conditions and/or time limitations.

Item #

**FIELD INSPECTION (Roadway)**

1. **Weather Restrictions (Section 401-3.01)**
  - a. What are the weather conditions?

Nominal Compacted Lift Thickness	Surface Temperature Minimum (See Note 1)	Seasonal Limits
75mm or greater	5°C (40°F)	None
Greater than 25mm but less than 75mm	8°C (47°F)	See notes 2 & 3
25mm or less	10°C (50°F)	See notes 2 & 3

- b. Is the minimum surface temperature being observed based on the course thickness? (Table 401-2)

**Notes:**

- 3. All temperatures shall be measured on the surface where paving is to be placed and the controlling temperature shall be the average of three temperature readings taken at locations 8±meters apart in accordance with the Department written instructions.
- 4. Top course shall be placed only during the period of April 1<sup>st</sup> up to and including the third Saturday of November in the counties of .....
- 5. Top course shall be placed only during the period of May 1<sup>st</sup> up to and including the third Saturday of October in all counties except as noted in Note 2.

**2. Equipment**

**Hauling Equipment (Section 401-3.04)**

- . Is the truck bed clean and smooth?
- a. Is the load covered?
- b. Is the truck bed surface lightly coated with approved solution prior to loading?
- c. d. What is the solution and is it an approved material?

**Bituminous Paver (401-3.05)**

- d. Is it self propelled?
- e. Is it capable of a lane width placement?
- f. Is the screed heated at the beginning of the paving operation or after periods of extended shutdown to avoid sticking.?
- g. Is the automatic transverse slope control approved?
- h. Is the automatic longitudinal grade screed control approved?
- i. From what references do the controls operate (the method of reference must be approved by the EIC)?
- j. If the paving width is greater than 5.2 m, are the references on both sides of the pavement?
- k. Was the paver examined and approved by the EIC?

**Rollers (401-3.06)**

**NOTE:** Most Hot-Mix Asphalt compaction efforts fall into one of three compaction series as defined by the eighth space of the item number. A 5 series is considered a 50 series compaction effort requiring daily coring.

On 50 series jobs, special notes in the contract specification will usually negate the invocation of that section of the standard specification dealing with compaction equipment and roller patterns.

On 60 series jobs, core samples and a nuclear density gauge are specified. During this type of compaction effort, special notes may or may not exclude portions of section 400 of the standard specification dealing with compaction equipment.

On 70 series jobs, (typically lower volume jobs), nuclear gauge with initial calibration is called for to test for compaction. In these jobs, section 400 is typically invoked in full force, necessitating the requirements of approved compaction efforts, roller patterns, etc.

The Area Engineer should become familiar with which type of compaction effort is called for (50, 60, or 70 series), look for any special specifications in the pavement section of the contract specification, and include/exclude those portions of the inspection guidance as necessary.

#### **Vibratory**

- l. Were the rollers examined and approved by the EIC?
- m. Is the vibratory roller on .....s approved list, "Bituminous Concrete Vibratory Compaction Equipment"?
- n. What is the vibratory frequency of the equipment?
- o. What is the roller's drum width?
- p. Does the roller have a speedometer (1 km/hr or 15 m/min indicator)?
- q. Does the roller have a speed control device which prevents speed in excess of 4 km/hr ) or 67 m/min when the roller is in vibratory mode?
- r. Was the speed control device approved by the Materials Bureau?

#### **Static Steel Wheel Roller**

- s. Is the roller self-propelled?
- t. What is the weight of the roller? (9 to 11 metric ton tandem three axle or 7 to 9 metric ton tandem two axle type)

- u. What is the axle type (2 or 3 axle)?

**Pneumatic Tire Roller**

- v. Is the roller self-propelled?
- w. What is the maximum wheel load (2600kg)?
- x. What is the tire compression on pavement (550 + 35 kPa)
- y. What is the maximum axle load (10160 kg)?

**3. Surface Preparation (Section 401-3.07)**

Is the condition of the aggregate, base or bituminous surface satisfactory for placement? (ex. clean, dry, etc.)

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**4. Tack or Prime (Section 407)**

- . Is the tack or prime coat specified?

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- a. If so, how is the application rate determined? (The application rate shall be 0.14 to 0.32 1/m as approved by the Engineer.)

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- b. Does the tack coat precede the asphalt paving such that the tack is not damaged?

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- c. Is the asphalt being placed prior to the bituminous material being thoroughly cured and dry? (for the brown tack coat this is about 15 minutes for the emulsion to break) MURK 1B Sct.400

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- d. Have the contacted surface of curbs, gutters, manholes, etc., been painted or sealed with bituminous material? (Section 401-3.07)

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**5. Paving Operation (Section 401-3.11)**

- . Has the engineer approved the paver reference? For initial pavement courses, usually a taut reference line is used. A moving reference line of at least 9 meters in length may be substituted for the reference line if satisfactory results can be achieved. A short ski or shoe may also be used for the initial course if a satisfactory fixed reference such as a curb, gutter, or other fixed reference is adjacent to the pavement.

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- a. What type of mechanical spreading/finishing equipment is being utilized?

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- b. Is the paver equipped with automatic grade/slope controls? Normally automatic controls are required unless existing grades at roadway intersections or a drainage structure must be met or if paving shoulders, temporary detours, behind curbs, or in other areas where its use is impractical as determined by the Engineer.

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- c. Is the placing of the mixture continuous at a desired rate of not less than 45 metric tons per hour?

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- d. Is a constant head of material kept in front of the screed and in the hopper? Is any excess material dropped in front of the paver?

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- e. Is the paver running at a constant speed to match the delivery of asphalt? If not, the paver should stop and start smoothly and quickly.

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- f. When trucks are dumping into the hopper, are wheels in contact with rollers? Is any excess bumping observed?

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**6. Rolling Operation (Sections 401-3.12)**

- . What type of compaction equipment is being used?

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- a. Is the compaction equipment the same as was used for the test section?

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- b. Is there a specified rolling pattern for this job? If yes what is it and is it being implemented on site?

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- c. Are the rollers moving at a constant, slow wheels nearest the paver? Are the wheels being kept moist? (No fuel oil) Are any rollers standing on the finished mat?

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- d. If the roller displaces any material, is the material replaced and grade restored to original grade?

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**7. Joints (401-3.13)**

- . In a multilayer project, are longitudinal and transverse joints being offset as required (150 mm)?

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a. On the top layer, is the longitudinal joint on the lane line?

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b. Is the longitudinal joint compacted in the static mode?

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c. Which type of longitudinal joint is the Contractor constructing (Butt Joint or Tapered Wedge Joint)?

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d. Has the paving operation proceeded so as not to leave more than 30 meters of a longitudinal pavement joint exposed to traffic?

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**8. Quantity Check**

. Are the project personnel checking the application rates?

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a. Does it compare favorably with plan quantities?

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b. Are depth, checks being taken? The tolerance for each layer is 6mm for thickness less than or equal to 100mm and 13mm for thickness greater than 100mm. The tolerance for the total pavement thickness is 6mm for depth less than or equal to 100mm, 13mm for depth greater than 100mm and less than or equal to 200mm and 16mm for depth greater than 200mm.

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c. Is the thickness of the cores being checked?

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**9. Surface Tolerance (Section 401-3.14)**

- . Is the finished surface checked for line and grade with a 3 meter straight edge which has no greater deviation than 6 mm for base coarse and 5 mm for wearing course?

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- a. Are any irregularities exceeding these specified limits corrected?

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- b. Has any smoothness testing been done to date? What were the results?

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- c. Make a qualitative judgment on smoothness of the pavement. If there are any concerns, have the field staff taken any corrective action?

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**10. Compaction Testing (Section 2.1.2.3 of QAP)**

**Test Section**

- . Did the contractor elect to do a test section?

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a. What were the results?

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b. What was the placement and after compaction layer thickness?

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c. Was the test section the same depth, at least 50m long and used the same equipment as the paving operation?

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d. How was the pavement density determined? (coring or nuclear gauge)

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e. If the nuclear gauge is used, was the density measured after each roller pass?

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f. What was the calculated correction factor for the nuclear gauge?

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g. Is the compaction performed with the same equipment?

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**Core Testing**

h. Is coring required for this lift? (see proposal)

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i. Has the project staff randomly defined four 150mm diameter coring locations per lot?

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j. Have these locations been withheld until the rolling operation is complete and all compaction equipment has left?

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k. How did the project staff determine the random locations? (Material Bureau computer program "Random" \_\_\_\_\_ or Random # table in 96-04M \_\_\_\_\_)

l. Have the cores been wrapped in a red security seal immediately after drilling in the presence of a state inspector? Has form BR309 been completed, put into a waterproof envelope and placed with the core in a polyethylene bag?

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m. Has the contractor elected to test the cores under Materials Procedure .....?

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- n. Check the Quality Adjustment Factors (QAF) for the placed asphalt pavement. Is the pavement of adequate quality?

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- o. Were 4 loose mix samples taken on each paving day (in accordance with AASHTO T 168-97)?

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**Nuclear Gauge (if applies)**

- p. What is the project target density (PTD) from the test section?

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- q. Is a qualified technician conducting the compaction testing?

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- r. Is the required density being obtained prior to the mat temperature reaching 79 C?

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- s. Are random locations determined at 50m intervals?

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- t. What are the results of the randomly located nuclear density tests? Is the density within the required range?

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- u. Are any two consecutive readings (four measurements)  $<PTD \times 0.96$ ?

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- v. Is the 10 test moving average  $>PTD \times 0.98$ ?

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- 11. If the roadway is subject to traffic, have temporary pavement markings been applied at the end of each day?

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**OFFICE PORTION (Roadway)**

- 1. Did the contractor elect to test pavement cores? If yes, did the Engineer define one additional core from two of the sublots within 0.3m from the original core location and at the same offset?

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- 2. Pick a random date when the paving operation was in progress and check the inspector's daily reports (IDR,s), pavement delivery tickets, core results and pay estimate for proper documentation of materials used, pay items involved, and required field tests and results (eg. temperatures of base and mix, yield and depth checks, application rate of prime or tack).

Dates sampled

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IDR's

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Based on discussions with the State personnel, are there any suggestions for changes in the procedures or requirements that might better improve the process?

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- 2. Hold a closeout conference and discuss all findings and how, if any, corrective actions will be performed?

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- 3. Summarize findings that are not procedural/project related and will need to be pursued beyond the individual project. This would include items related to standard plans, specifications, construction directives, materials procedures and the like.

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