New Jersey Department of Transportation
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Baseline Document Change Announcement

ANNOUNCEMENT: BDC25S-02

DATE: March 27, 2025

SUBJECT: High Performance Thin Overlay
- **Revisions to Subparts 406.03.01, 902.08.02, and 902.08.03 of the 2019 Standard Specifications for Road and Bridge Construction.**

Subpart 406.03.01 of the 2019 Standard Specifications for Road and Bridge Construction has been revised to update air void requirements for High Performance Thin Overlay to improve resistance to rutting and blistering. Subparts 902.08.02 and 902.08.03 have been revised to updated JMF, Volumetric, Performance Testing, and Sampling Requirements.

The following revisions have been incorporated into the 2019 Standard Specifications via the 2019 Standard Inputs, SI2019:

406.03.01 High Performance Thin Overlay

H. Air Void Requirements on Roadway.
THE FOURTH PARAGRAPH OF PART H IS CHANGED TO:

> The ME will calculate the percent defective (PD) as the percentage of the lot outside the acceptable range of 2 percent air voids to 7 percent air voids. The acceptable quality limit is 10 percent defective. For lots in which PD < 10, the Department will award a positive pay adjustment. For lots in which PD > 10, the Department will assess a negative pay adjustment.

PART 2 IS CHANGED TO:

2. Quality Index (Q).

$$Q_L = \frac{(\bar{X} - 2.0)}{S}$$

$$Q_U = \frac{(7.0 - \bar{X})}{S}$$

902.08.02 Mix Design
THE SUBPART IS CHANGED TO:

At least 45 days before initial production, submit a job mix formula for the HPTO on forms supplied by the Department. Include a statement naming the source of each component and a report showing the results meet the criteria specified in Table 902.08.02-1 and Table 902.08.02-2.

For the job mix formula for the HPTO mixture, establish the percentage of dry weight of aggregate passing each required sieve size and an optimum percentage of asphalt binder based upon the weight of the total mix. Determine the optimum

percentage of asphalt binder according to AASHTO R 35 and M 323 with an N_{des} of 50 gyrations. Before maximum specific gravity testing or compaction of specimens, condition the mix for 2 hours according to the requirements for conditioning for volumetric mix design in AASHTO R 30, Section 7.1. If the absorption of the combined aggregate is more than 1.5 percent according to AASHTO T 84 and T 85, condition the mix for 4 hours according to AASHTO R 30, Section 7.2 prior to compaction of specimens (AASHTO T 312) and determination of maximum specific gravity (AASHTO T 209). Ensure that the job mix formula is within the master range specified in Table 902.08.02-1.

Table 902.08.02-1 JMF Requirements for HPTO

Sieve Sizes	Percent Passing[1]	Production Control Tolerances[2]
3/8"	100	±0.0%
No. 4	65 – 85	±4.0%
No. 8	30 – 45	±4.0%
No. 16	20 – 35	±3.0%
No. 30	15 – 30	±3.0%
No. 50	10 – 20	±2.0%
No. 100	5 – 15	±2.0%
No. 200	5.0 – 8.0	±1.0%
Asphalt Binder Content (Ignition Oven)		±0.40%

1. Aggregate percent passing to be determined based on dry aggregate weight.
2. Production tolerances are applied to the approved JMF for gradation and asphalt binder content. Gradation results may not fall outside of the wide band gradation limits when tolerances are applied.

Design the HPTO to meet the requirements in Table 902.08.02-2.

Table 902.08.02-2 Volumetric Requirements for Design and Control of HPTO

	Required Density (% of Max Sp. Gr.)		Voids in Mineral Aggregate (VMA)	Dust-to-Binder Ratio	Draindown[1] AASHTO T 305
	@ N_{des} (50 gyrations)	@ N_{max} (100 gyrations)			
Design Requirements	96.0	≤ 99.0	≥ 17.0 %	0.6 – 1.2	≤ 0.1 %
Control Requirements	95.0 – 97.0	≤ 99.0	≥ 17.0 %	0.6 – 1.3	≤ 0.1 %

1. Draindown testing is at the discretion of the ME.

Ensure that the job mix formula provides a mixture that meets a minimum tensile strength ratio (TSR) of 85 percent when prepared according to AASHTO T 312 and tested according to AASHTO T 283 with the following exceptions:

1. Before compaction, condition the mixture for 2 hours according to AASHTO R 30 Section 7.1.
2. Compact specimens with 40 gyrations.
3. Extrude specimens as soon as possible without damaging.
4. Use AASHTO T 269 to determine void content.
5. Record the void content of the specimens.
6. If less than 55 percent saturation is achieved, the procedure does not need to be repeated, unless the difference in tensile strength between duplicate specimens is greater than 25 pounds per square inch.
7. If visual stripping is detected, modify or readjust the mix.

For each mix design, submit 3 gyratory specimens and 1 loose sample corresponding to the composition of the job mix formula, including the design asphalt content. The ME will use these samples for verification of the properties of the job mix formula. Compact the specimens to the design number of gyrations (N_{des}). To be acceptable all 3 gyratory specimens must comply with the gradation requirements in Table 902.08.02-1 and with the design requirements in Table 902.08.02-2. The ME reserves the right to be present at the time of molding the gyratory specimens.

In addition, submit 11 gyratory specimens and two boxes of loose mix to the ME. The ME will use these additional gyratory samples for performance testing of the HPTO mix. The ME reserves the right to be present at the time of molding the gyratory specimens. Ensure that the additional gyratory specimens are compacted according to AASHTO T 312. Compact 6 of the specimens to 77 millimeters in height and an air void content of 5.0 ± 0.5 percent. The ME will test the six 77 millimeter specimens using an Asphalt Pavement Analyzer (APA) according to AASHTO T 340 at 64 °C, 100 pound per square inch hose pressure, and 100 pound wheel load. Compact the other 5 specimens to 115 millimeter in height. These 5 specimens will be cut, from the middle of each 115 millimeter in height specimen, to 38 millimeter in height test specimens. The air void content of the 5 cut specimen will be determined to ensure compliance with the target air void content of 5.0 ± 0.5 percent. The ME will use the five 38 millimeter in height specimens to test using an Overlay Tester (NJDOT B-10) at 25 °C and a joint opening of 0.025 inch. The ME will eliminate the high and low Overlay test results then average and report the middle 3 test results. The ME will ensure that all submitted specimens are within the target air void content as tested at the Materials' Central Lab. The ME will not accept specimens lower than the target air void content, but may accept and test specimens higher than the target air void content.

The ME will approve the JMF if the average rut depth for the 6 specimens in the Asphalt Pavement Analyzer testing is not more than 3.0 millimeters at 8,000 loading cycles and the average number of cycles to failure in the Overlay Tester is not less than 1,200. If the JMF does not meet the APA and Overlay Tester criteria, redesign the HPTO mix and submit for retesting. The JMF for the HPTO mixture is in effect until modification is approved by the ME.

When unsatisfactory results for any specified characteristic of the work make it necessary, the Contractor may establish a new JMF for approval. In such instances, if corrective action is not taken, the ME may require an appropriate adjustment to the JMF.

Should a change in sources or changes in the properties of materials occur, the ME will require that a new JMF be established and approved before production can continue.

The ME may verify a mix on an annual basis rather than on a project-to-project basis if the properties and proportions of the materials do not change. If written verification is submitted by the HMA supplier that the same source and character of materials are to be used, the ME may waive the requirement for the design and verification of previously approved mixes.

902.08.03 Sampling and Testing
PART B IS CHANGED TO:

B. Sampling. The ME will take a sample of HPTO for volumetric acceptance testing from each 700 tons of a mix. The ME will perform sampling according to AASHTO T 168, NJDOT B-2, or ASTM D 3665. During production at the plant, a sample of asphalt binder will be taken once every 1,400 tons or as directed by the ME.

D. Acceptance Testing and Requirements.
THE THIRD PARAGRAPH OF PART D IS CHANGED TO:

Ensure that the HMA mixture conforms to the requirements specified in Table 902.08.02-2, and to the gradation and asphalt content requirements in Table 902.08.02-1. If the test results are outside of the requirements specified in Table 902.08.02-1 or Table 902.08.02-2 for an acceptance sample, immediately run a quality control sample. If the quality control sample is also outside of the control requirements specified in Table 902.08.02-1 or Table 902.08.02-2, determine if a plant adjustment is needed and take corrective action to bring the mix into compliance. Take an additional quality control sample immediately after completing the corrective action to ensure that the mix is within the requirements. If the mix is within the requirements based on the quality control sample results, then the ME will immediately take an acceptance sample to test and verify that the composition meets the requirements specified in Table 902.08.02-1 and Table 902.08.02-2. If 2 consecutive acceptance or quality control samples are outside the requirements specified in Table 902.08.02-1 or Table 902.08.02-2, immediately stop production and shipping.

E. Performance Testing.
THE FOURTH PARAGRAPH OF PART E IS CHANGED TO:

If a sample does not meet the criteria for performance testing as specified in Table 902.08.03-1, the Department will assess a pay adjustment as specified. The Department will calculate the pay adjustment by multiplying the percent pay adjustment (PPA) by the quantity in the lot and the bid price for the HPTO item. If APA rutting is greater than 8.0 millimeters or Overlay cycles is less than 400 or both, the Department will assess the maximum pay adjustment of PPA = -100 percent or may require removal and replacement. PPA for both APA and Overlay are cumulative and

may not exceed -100 percent in total. If samples received are lower than the target air void range, 5.0 ± 0.5 percent, the Department will consider the samples untestable and assess a PPA of -100 percent or may require removal and replacement of the lot. If the Department requires removal and replacement, then the replacement work is subject to the same requirements as the initial work.

TABLE 902.08.03-1 IS CHANGED TO:

Table 902.08.03-1 Performance Testing Pay Adjustments for HPTO

Test	Requirement	Test Result	PPA
APA @ 8,000 loading cycles, mm (AASHTO T 340)	3.0 maximum	$t \leq 3.0$ $3.0 < t \leq 8.0$ $t > 8.0$	0 -10(t-3) -100 or Remove & Replace
Overlay Tester, cycles (NJDOT B-10)	1,200 minimum	$t \geq 1,200$ $1,200 > t \geq 400$ $t < 400$	0 -(1,200-t)/16 -100 or Remove & Replace

Implementation Code S (SPECIAL)

Changes must be implemented in all applicable Department projects scheduled to be bid after June 15, 2025.

Recommended By:

Tina Shutz
Director
Capital Program Support

Approved By:

Parth Oza, P.E.
Assistant Commissioner
Capital Program Management
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TS: MS: NJB