



To: <p style="text-align: center;">SUPERSEDED BY EI 09-006 EFFECTIVE 5/7/09</p>		<p style="text-align: center;">New York State Department of Transportation ENGINEERING INSTRUCTION</p>	<p style="text-align: center;">EI 06-012</p>
Title: REVISION TO HOT MIX ASPHALT (HMA) MIXTURE DESIGN REQUIREMENTS IN STANDARD SPECIFICATIONS SECTION 401			
Distribution: <input checked="" type="checkbox"/> Manufacturers (18) <input checked="" type="checkbox"/> Local Govt. (31) <input checked="" type="checkbox"/> Agencies (32) <input type="checkbox"/> Surveyors (33) <input type="checkbox"/> Consultants (34) <input checked="" type="checkbox"/> Contractors (39) <input type="checkbox"/> _____ ()		Approved:  R.L. Sack Deputy Chief Engineer, Technical Services 5 MAY 06 Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective upon signature.
- This EI does not supersede any other issuances.
- The revisions issued with this EI will be incorporated into a future update of the Standard Specifications.

PURPOSE: The purpose of this EI is to revise Standard Specification Section 401, *Plant Production*.

TECHNICAL INFORMATION:

- This EI issues changes to §401-4, Table 401-8, *Air Voids in Plant Mixture*.
- HMA mixture design changes to Materials Method (MM) 5.16, *Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures* are being issued concurrently with this EI via EB 06-020.
- A cost increase due to increase in asphalt content resulting from the revised mix design requirements will likely result in approximately a \$1.00 increase in the price per metric ton of HMA. The increased cost to the Department is expected to be offset by reduced maintenance costs associated with premature raveling and cracking of HMA pavements.
- It is anticipated that as a result of this change, bid prices for affected items will increase by approximately \$1.00 per ton of HMA. Until sufficient bid history data is available, Designers should factor this into their estimates.

IMPLEMENTATION:

- Main Office Design Quality Assurance Bureau will insert the Standard Specification Shelf Note into contract proposals beginning with projects submitted for the letting of 9/7/2006.
- For on-going contracts
 - Any HMA mixture design that does not contain the minimum asphalt content given in the revised MM 5.16 shall be modified to meet the revised requirements. Revised mix designs will result in increased costs to Contractors.
 - The increased cost is estimated to be \$1.00 per ton of HMA. For any contract that requires a modified HMA mixture design, the Contractor will be allowed a \$1.00 per ton increase in the price of HMA. No price increases for factors other than additional PG Binder material costs are contemplated or allowed. A Contractor may opt to provide the Department with a price analysis to support an increase greater than \$1.00 per ton.
 - Engineers-in-Charge of on-going contracts should create a new contract pay item for Supplemental HMA Material Cost Increase with a unit price of \$1.00 per ton and use quantities

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of affected HMA items placed. The new item may be paid by Field Change Order (FCO) or Order-on-Contract (OOC).

- Engineers-in-Charge should include a copy of this EI with the first required FCO or OOC as documentation of a change in accordance with Contract Administration Manual (CAM) §104-03I.4.

TRANSMITTED MATERIALS: Attached to this issuance is Standard Specification Shelf Note *HMA Quality Adjustment Factors*.

BACKGROUND: In 1996, the Department began implementing the Superpave HMA mixture design system and adopted it as the standard mix design system in 2002. The objective of adopting the Superpave system was primarily to reduce pavement deformation due to rutting and thermal cracking. In general, Superpave mixtures significantly reduced pavement deformation due to rutting and thermal cracking. However, the existing design requirements do not ensure adequate asphalt to provide long-term durability and many pavements exhibit premature raveling and reflective cracking. Both reflective cracking and raveling (the loss of aggregate particles) are primarily a result of low asphalt content. These concerns have been encountered throughout the nation and continue to be the focus of national research. Many states have already implemented mix design changes similar to those being transmitted with this issuance.

The mix design revisions transmitted with this issuance are the result of a joint work group comprised of NY Construction Materials Association and Department representatives. The work group reviewed the performance of several pavements in New York State compared to the mix design, changes made by other states, past research findings, and preliminary findings from ongoing national research. The agreed upon changes will systematically help increase PG binder in the HMA mixture to provide more durable HMA pavements, but should not significantly increase the potential for rutting.

CONTACT: Direct questions regarding this EI to Zoeb Zavery of the Materials Bureau at (518) 485-5277 or via e-mail at zzavery@dot.state.ny.us.

HMA QUALITY ADJUSTMENT FACTORS

Make the following changes to Volume 1 of 3 of the Standard Specifications:

Page 4-10, §401-3.04 C, **Delete** the paragraph and **Replace** it with the following:

C. Air Void and Gradation Reporting. Report the air void test values to the nearest 0.01 of a percent and aggregate gradation test value to the nearest 0.1 of a percent. When determining test results acceptability, the air void test value is referenced to the mix design median of 3.5 percent and the gradation test value is referenced to the Job Mix Formula (JMF) target value.

Page 4-23, §401-4, **Delete** the fourth paragraph and **Replace** it with the following:

When any material with plant air voids of less than 1.5% and greater than 5.5% which results in a QAF of 0.85, the Engineer will evaluate the subject material to determine if it will be left in place. The considerations for determining whether the material in question is left in place are, but not limited to:

- Type of material produced
- The layer in which the material was placed
- The location of the project

Page 4-24, §401-4, **Delete** Table 401-8 and **Replace** it with the following:

(Note that the only change is in the heading of the first column. The Table is reprinted for clarity.)

TABLE 401-8 AIR VOIDS IN PLANT MIXTURE (Volumetric Designs)	
Average Absolute Value (Test Value - 3.5)	Quality Adjustment Factor (QAF)
0.00 - 0.17	1.05
0.18 - 0.33	1.04
0.34 - 0.50	1.03
0.51 - 0.67	1.02
0.68 - 0.83	1.01
0.84 - 1.00	1.00
1.01 - 1.10	0.99
1.11 - 1.20	0.98
1.21 - 1.30	0.97
1.31 - 1.40	0.96
1.41 - 1.50	0.95
1.51 - 1.60	0.94
1.61 - 1.70	0.93
1.71 - 1.80	0.92
1.81 - 1.90	0.91
1.91 - 2.00	0.90
over 2.00	0.85