Standard Specification for

Balanced Mix Design

AASHTO Designation: MP 46-20[1]

Technical Subcommittee: 2d, Proportioning of Asphalt–Aggregate Mixtures

Release: Group 3 (July)

AASHTO

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1. SCOPE

1.1. This specification for balanced mix design uses volumetric and/or performance-based/related test results to produce job-mix formulas for asphalt mixtures.

1.2. This standard specifies minimum performance testing requirements for balanced design of asphalt mixtures.

1.3. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. REFERENCED STANDARDS

2.1. *AASHTO Standards*:

- PP 105, Balanced Design of Asphalt Mixtures
- T 246, Resistance to Deformation and Cohesion of Hot Mix Asphalt (HMA) by Means of Hveem Apparatus
- T 283, Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage
- T 320, Determining the Permanent Shear Strain and Stiffness of Asphalt Mixtures Using the Superpave Shear Tester
- T 321, Determining the Fatigue Life of Compacted Asphalt mixtures Subjected to Repeated Flexural Bending
- T 322, Determining the Creep Compliance and Strength of Hot Mix Asphalt Using the Indirect Tensile Test Device
- T 324, Hamburg Wheel-Tracking Testing of Compacted Asphalt Mixtures
- T 340, Determining Rutting Susceptibility of Hot Mix Asphalt (HMA) Using the Asphalt Pavement Analyzer (APA)
- T 378, Determining the Dynamic Modulus and Flow Number for Asphalt mixtures Using the Asphalt Mixture Performance Tester (AMPT)
- TP 105, Determining the Fracture Energy of Asphalt Mixtures Using the Semicircular Bend Geometry (SCB)
- TP 107, Determining the Damage Characteristic Curve and Failure Criterion Using the Asphalt Mixture Performance Tester (AMPT) Cyclic Fatigue Test

- TP 124, Determining the Fracture Potential of Asphalt Mixtures Using the Flexibility Index Test (FIT)
- TP 125, Determining the Flexural Creep Stiffness of Asphalt Mixtures Using the Bending Beam Rheometer (BBR)

2.2. *ASTM Standards*:

- D7313, Standard Test Method for Determining Fracture Energy of Asphalt-Aggregate Mixtures Using the Disk-Shaped Compact Tension Geometry
- D7870, Standard Practice for Moisture Conditioning Compacted Asphalt Mixture Specimens by Using Hydrostatic Pore Pressure
- D8044, Standard Test Method for Evaluation of Asphalt Mixture Cracking Resistance Using the Semi-Circular Bend Test (SCB) at Intermediate Temperatures
- D8225, Standard Test Method for Determination of Cracking Tolerance Index of Asphalt Mixture Using the Indirect Tensile Cracking Test at Intermediate Temperature

2.3. *Other Documents*:

- NJDOT B-10, Overlay Test
- Tex-248-F, Overlay Test
- WK60626, New Test Method for Determining Thermal Cracking Properties of Asphalt Mixtures through Measurement of Thermally Induced Stress and Strain

3. TERMINOLOGY

3.1. *Definitions*:

3.1.1. *ADT*—average daily traffic.

3.1.2. *design ESALs*—design equivalent (80-kN) single-axle loads.

3.1.3. *HMA*—hot mix asphalt.

3.1.4. *NMAS*—nominal maximum aggregate size.

3.1.5. *WMA*—warm mix asphalt.

4. SIGNIFICANCE AND USE

4.1. This standard may be used to select and evaluate materials for balanced design of asphalt paving mixtures. This approach is only applicable to pavements with design traffic greater than 3 million ESALs or high stress non-highway applications.

5. RUTTING TESTS

5.1. Highway agencies should select one of the tests in this section.

5.2. *Asphalt Pavement Analyzer (AASHTO T 340)*:

5.2.1. *Specimen Conditioning and Aging*—Condition loose mix test samples in accordance to R 30 Section 7.2, “Short Term Conditioning for Mechanical Property Testing.”