Laboratory SOP 36
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Georgia Department of Transportation
Office of Materials and Research

Standard Operating Procedure (SOP) 36

Certification of Laboratory and Personnel For Design of SMA and/or Superpave Asphaltic Concrete Mixtures

I. General

This document provides information and outlines procedures for certifying private entities in the design of asphaltic concrete mixtures. Superpave mixes shall be designed in accordance with the SHRP Superpave System, except as otherwise specified. For Superpave volumetric mix designs, AASHTO T-312, *Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor* and AASHTO R-30, *Mixture Conditioning of Hot Mix Asphalt (HMA)* will be used. Stone Matrix Asphalt (SMA) mixtures shall be designed in accordance with GDT-123 "Determining the Design Proportions of Stone Matrix Asphalt Mixtures".

This document outlines the certification process for both the design laboratory and the SMA Mix Design and/or Superpave Mix Design Technician. Certification of mix design laboratories and technicians is a function of the Bituminous Construction Branch of the Office of Materials and Research (OMR) at Forest Park, Georgia.

II. Laboratory Certification

The design of asphaltic concrete mixtures is a very technical process requiring highly skilled testing personnel, precision testing equipment, and close adherence to design guidelines and test procedures to assure high quality mix designs.

It is a requirement for lab certification that the design equipment must meet all requirements and tolerances stated in the test procedures listed below. Equipment calibration records shall be furnished to OMR for review prior to initial certification and shall be available for inspection at all times. Equipment shall be calibrated at least semi-annually or as otherwise directed. The laboratory building used to fabricate asphaltic concrete mix designs should be large enough to accommodate all equipment with adequate space remaining to perform all design-related tasks in a safe manner.

Requests for laboratory certification shall be in the form of a letter to the State Materials and Research Engineer, providing the company name, lab location, telephone number, and names of laboratory personnel. After the request is received, the Office of Materials and Research will provide the requesting laboratory specific instructions for an on-site inspection and will establish an inspection date. After completion of the laboratory inspection, a letter will be sent approving or disapproving the laboratory. If the laboratory is approved, a certificate will be issued. If the laboratory is not approved, a detailed description will be provided identifying areas needing improvement.

Participation in applicable areas of AMRL certification programs may be accepted in lieu of OMR inspection. Other certification programs may be acceptable if approved by the Office of Materials and Research.

Re-certification of the Superpave mix design laboratory may be required bi-annually at the discretion of the Office of Materials and Research. Random laboratory inspections may also be made at any time. The Department reserves the right to revoke certification if the requirements described herein are not met at all times.

III. Test Procedures

AASHTO R-30, "Mixture Conditioning of Hot Mix Asphalt (HMA)" Note: The procedure is modified for GDOT mix designs to require only two hours aging.

AASHTO T-11, “Materials Finer Than 75µm (No. 200) Sieve in Mineral Aggregates by Washing”

AASHTO T-27, “Sieve Analysis of Fine and Coarse Aggregates”

AASHTO T-30, "Mechanical Analysis of Extracted Aggregates"

AASHTO T-304, “Uncompacted Void Content of Fine Aggregate”

AASHTO T-84, “Specific Gravity and Absorption of Fine Aggregate”

AASHTO T-85, “Specific Gravity and Absorption of Coarse Aggregate”

AASHTO T-166, “Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens”

AASHTO T-209, “Maximum Specific Gravity of Bituminous Paving Mixtures”

AASHTO T-312, “Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of Superpave Gyratory Compactor”

ASTM PS-129 "Measurement of Permeability of Bituminous Paving Mixtures Using a Flexible Wall Permeameter"

GDT 22, “Method of Test for Sieve Analysis of Mineral Filler”

GDT 38, “Method of Test for Mechanical Analysis of Extracted Aggregate”

GDT 56, “Method of Test for Heat Stable Anti-Strip Additive”

GDT 63, “Method of Test for Sand Equivalent of Soil and Fine Aggregate”

GDT 66, “Method of Test for Evaluating the Moisture Susceptibility of Bituminous Mixtures by Diametral Tensile Splitting”

GDT 83, “Method of Test for Extraction of Bitumen from Paving Mixtures Using the Vacuum Extractor”

GDT 115, “Method of Test for Determining Rutting Susceptibility Using the Asphalt Pavement Analyzer”

GDT 123, “Determining the Design Proportion for Stone Matrix Asphalt Mixtures”

GDT 125, “Method of Test for Determining Asphalt Content by Ignition”

IV. Mix Design Cooperative Testing

All labs that are certified to design SMA and/or Superpave asphaltic concrete mixtures will be required to participate in annual cooperative testing and must receive minimum ratings of at least 3.0 according to the rating scale below. Tests may be assigned at the discretion of the Office of Materials and Research for maximum and effective specific gravity, Superpave mix design volumetrics, moisture susceptibility, asphalt content, aggregate gradation, rutting susceptibility, and other design-related procedures.

Rating	Test Results
5	Within 1.0 standard deviation of mean
4	Within 1.5 standard deviations of mean
3	Within 2.0 standard deviations of mean
2	Within 2.5 standard deviations of mean
1	Within 3.0 standard deviations of mean
0	Data 3.0 or more standard deviations of mean

Ratings less than 3.0 will require that an investigation be conducted by the SMA Mix Design and/or Superpave Mix Design Technician and a written explanation, describing the findings, and any corrective action taken, be submitted

to the State Materials and Research Engineer. The investigation shall be conducted within a 15 working day period and may include additional testing of cooperative samples.

If the investigation reveals an acceptable level of quality control, the laboratory shall remain on approved status.

V. Review and Withdrawal of Certification

If the investigation reveals unacceptable accuracy or reliability, the laboratory shall be placed in a Temporary Improvement status during which time a special investigation will be conducted by the Office of Materials and Research .

In addition, a certified laboratory shall be subject to a special investigation when, in the finding of the State Materials and Research Engineer, the mix designs submitted from it are of marginal or doubtful accuracy or reliability. If the special investigation reveals one or more continuing, serious deficiencies in performance, training, or equipment, laboratory certification shall be withdrawn until, in the finding of the State Materials an Research Engineer, the deficiency has been satisfactorily resolved.

VI. Certification of Superpave Design Technicians

The SMA Mix Design and/or Superpave Mix Design Technician is responsible for all designs submitted to the Office of Materials and Research for consideration.

A. Certification Requirements

The Superpave Mix Design and/or SMA Mix Design Technician shall be certified through The National Center for Asphalt Technology (NCAT) in Auburn, Alabama, by taking a certification training course and completing a final exam with a score of 80 or better. Applicants who score at least 70 but less than 80 on their first exam may retake a final exam after 60 days without retaking the training course. An applicant who scores below 70 or fails the test more than once with scores of at least 70 make retake the exam only after a 60-day waiting period and retaking the training course. ***A Superpave Mix Design Certification is a prerequisite for SMA Mix Design Certification.***

B. Condensed Certification Course

Certification as a SMA Mix Design and/or Superpave Mix Design Technician by the Asphalt Institute or other approved training center or considerable experience in the area of Superpave mix design may be accepted in lieu of the above requirements. These applicants must attend a condensed training course by NCAT and complete a final exam with a score of 80 or better. The Office of Materials and Research will determine whether an applicant qualifies for the condensed course.

C. Certificate

Upon obtaining a satisfactory test score, the technician will be issued a certification number by the Office of Materials and Research.

D. Loss of Certification

SMA Mix Design and/or Superpave Design Technicians may lose their certification(s) by revocation. Reasons for revocation may include providing erroneous reports or records, negligence or incompetence, or inactivity in performing design duties for six consecutive months, as determined by the Office of Materials and Research. All reported incidents will be investigated, and determination of revocation will be made by the State Materials and Research Engineer. Superpave Design Technicians who lose their certification due to providing erroneous reports or records will not be eligible for re-certification unless approved by the State Materials and Research Engineer. Revocation for other reasons may require additional training, further experience approved by the Office of Materials and Research for certification, or a combination of such training and experience.

VII. Technician's Warranty

Completed designs and supporting worksheets from a certified laboratory shall be submitted along with a cover letter signed by the Superpave Design Technician when forwarding to the Bituminous Construction Branch of the Office of Materials and Research for approval. The mix design cover letter shall be notarized and contain the following statement:

" I_____, SMA Mix Design and/or Superpave (indicate type of mix design certification) Design Technician Certification Number_____ for_____, do attest to the best of my knowledge that the information contained in this design request is based on factual test results obtained under my supervision during the fabrication of this mix design."

Guidance for preparing and submitting designs is provided in SOP-2.

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Georgene M. Geary, P.E.
State Materials and Research Engineer

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Thomas B. Howell, P.E.
Director of Construction .