

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENT 1041
ASPHALT CONCRETE MIX DESIGN AND QUALITY CONTROL PROGRAM**

October 15, 2004

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I. SCOPE

- A. This supplement outlines the requirements for Contractor's employees:
 - 1. to perform asphalt concrete quality control testing under the Level 1 testing program.
 - 2. to perform asphalt concrete mix designs under the Level 2 testing program.
- B. This supplement outlines the requirements for a Contractor's or consultant's laboratory:
 - 1. with the proper equipment to perform asphalt concrete quality control testing in accordance with 441 and 442 (Level 1 Laboratory).
 - 2. with the proper equipment to perform asphalt concrete mix designs and quality control testing (Level 2 Laboratory).

II. ADMINISTRATION

- A. The Division of Construction Management is responsible for the control of the Asphalt Concrete Mix Design and Quality Control Program based on the recommendations of the Asphalt Materials Engineer, Office of Materials Management. The Control Group will consist of the following Department personnel:
 - 1. Deputy Director, Division of Construction Management
 - 2. Administrator, Office of Construction Administration
 - 3. Administrator, Office of Materials Management

- B. The administration of the daily activities of the Asphalt Concrete Mix Design and Quality Control Program will be performed by the Asphalt Materials Engineer, Office of Materials Management.

III. PERSONNEL APPROVAL

A. Level 1

- 1. The Department will approve quality control personnel upon satisfactory completion of the Level 1 Examination.
- 2. Eligibility requirements for the examination are the submission of proof of successful completion of a Department approved asphalt concrete quality control course.

B. Level 2

- 1. The Department will approve mix design personnel upon satisfactory completion of the Level 2 Examination.
- 2. Eligibility requirements for the examination are the submission of proof of successful completion of a Department approved asphalt concrete mix design course.

C. Removal from Work

- 1. Contractors and their employees are subject to the provisions of 108.05.
- 2. Any incident or problem will be investigated by the District Engineer of Tests who will make a recommendation to the Asphalt Materials Engineer. The final decision will be made by the Control Group in written form.

IV. LABORATORY APPROVAL

A. Level 1

- 1. A Level 1 Laboratory shall will contain the following equipment:
 - a. an Asphalt Content Nuclear Gauge (AC Gauge). This AC Gauge shall be a Troxler 3241-C with a 100mCi \pm 10 percent Am-241; Be neutron source or an equivalent gauge, approved by the Laboratory, with a 100mCi \pm 10 percent source and the capability of transferring its calibration data in accordance with Supplement 1043 to a Troxler gauge meeting the above requirements. The AC Gauge shall be located in the Level 0 Laboratory such that it is at least 10 feet from the nearest variable hydrogen source. This includes haul roads, asphalt binder or emulsion tanks, water storage tanks, etc.
 - b. a minimum 10,000g digital balance which reads to the nearest 0.1g

- c. a minimum of eight (8) AC Gauge pans
 - d. an AC Gauge printer
 - e. a mechanical convection oven capable of maintaining a constant temperature of $356 \pm 18^{\circ}\text{F}$ ($180 \pm 10^{\circ}\text{C}$) with a minimum capacity of 3.00 ft^3 (0.085m^3)
 - f. appropriate size oven capable of maintaining a uniform temperature of $230 \pm 9^{\circ}\text{F}$ ($110 \pm 5^{\circ}\text{C}$)
 - g. mechanical shaker for 8.00 in (203mm) or 12.00 in (305mm) sieves for gradation analysis
 - h. set of 8 inch diameter or 12 inch diameter sieves meeting the requirements of ASTM E11, " Specification for Wire-Cloth and Sieves for Testing Purposes" and of the proper size to ensure conformance to the appropriate gradation specifications.
 - i. balances that meet the appropriate specifications
 - j. include a pre-approved asphalt ignition oven. The laboratory will have adequate space, proper ventilation, and proper oven height to easily perform tests with the oven. Also the laboratory will include the following additional equipment:
 - a. a shield for covering hot samples
 - b. clean gloves designed for handling 1000°F (540°C) material
 - c. safety goggles or face shield
 - k. 3000g electrical centrifuge meeting the requirements of ASTM D 2172
 - l. non-corrosive flat pan 12.00in x 8.00in x 1.00in (305mm x 203mm x 25mm) deep.
 - m. hot plate
 - n. 1000ml graduate
 - o. crucible suitable for ash determination
 - p. bunsen burner or approved equal
 - q. water bath meeting the requirements of AASHTO T 245
 - r. 4000 ml glass flask or metal pycnometer meeting the requirements of AASHTO T 209
 - s. vacuum pump or water aspirator capable of evacuating air from the container to a residual pressure in accordance with AASHTO T 209
 - t. thermometers will be Type 17 C meeting the requirements of ASTM E 1
 - u. automatic, calibrated Marshall specimen compactor and extractor meeting the requirements of AASHTO T 245
 - v. when 442 is specified, an automatic, calibrated Gyratory specimen compactor meeting the requirements of AASHTO T 312
 - w. miscellaneous equipment as required by the appropriate specification
2. A Level 1 Laboratory will have a minimum floor area of 200 square feet (18.6m^2).
 3. The inside temperature of a Level 1 Laboratory will be maintained at 68 to 86°F (20 to 30°C) during working hours.

4. Level 1 Laboratories will be inspected a minimum of once every two years by Department personnel. There is no maximum number of times a laboratory may be inspected.
5. Level 1 Laboratories may be required to participate in the Department's Reference Testing Program.

B. Level 2

1. A Level 2 Laboratory shall meet all the equipment and size requirements of a Level 1 Laboratory and will have the following equipment:
 - a. muffle furnace capable of maintaining a temperature between 932 and 1112°F (500 and 600°C)
 - b. heated water bath capable of maintaining 140 ± 2°F (60 ± 1.0°C)
 - c. Marshall test apparatus meeting the requirements of AASHTO T 245
 - d. miscellaneous equipment as required by the appropriate specifications
2. An asphalt ignition oven is not required for a Level 2 Laboratory.
3. Level 2 Laboratories will be inspected a minimum of once every two years by Department personnel. There is no maximum number of times a laboratory may be inspected.
4. Level 2 Laboratories are required to participate in the Department's Reference Testing Program.

C. Loss of Approval

1. Failure to maintain required equipment in good condition may result in loss of approval of a laboratory. Loss of approval can be invoked, in written form, by the District Engineer of Tests or the Asphalt Materials Engineer. Re-approval will be granted once the deficiencies have been corrected.
2. Chronic failure to maintain required equipment in good condition may result in loss of approval of a Level 2 person to perform work per Section III.C.