**Supplemental Technical Specification for**

# Inspection and Approval of Asphalt Field Laboratories

**SCDOT Designation: SC-M-404 (06/07)**

## 1. SCOPE

1.1 This method covers the process for inspection and approval of asphalt plant field laboratories for use in testing of asphalt mixtures. This method is not a safety inspection. The Contractor is responsible for maintaining the safety requirements for the asphalt field labs.

## 2. REFERENCED DOCUMENTS

2.1 SCDOT Standard Specifications

2.1.1 Division 300, Division 400

2.2 AASHTO Standards

2.2.1 T 245, T 312, R 18

2.3 SCDOT Test Methods

2.3.1 SC-T-66, SC-T-68, SC-T-71, SC-T-75, SC-T-78, SC-T-83

## 3. REQUIREMENTS FOR ALL FIELD LABORATORIES

3.1 Ensure that the building is made and designed for use as either a laboratory or office that has been converted to serve as a laboratory. The minimum allowable laboratory working floor space is 250 square feet with a minimum inside width of 9 foot. Under no circumstances will a tractor trailer or any other cargo type trailer be acceptable. Provide 2 working doors for safety purposes.

3.2 Provide all required field laboratory equipment listed on the asphalt field lab checklist, SC-M-404A, and ensure that all equipment meets requirements specified in the standard specifications and any supplemental specifications for gyratory and Marshall mixes

3.3 Calibrate the required field lab equipment according to **AASHTO R 18**, using SCDOT checking, verification, and calibration procedures. Make available all equipment calibration records and keep them in an organized manual in the field laboratory.

3.4 Equip the laboratory with windows, doors and ventilation systems that function properly and maintain the ambient air temperature between 65$^{o}$F and 80$^{o}$F.

3.5 Locate the building in close proximity to the plant and with full view of most major components of the plant. The Asphalt Materials Engineer has the final ruling on what laboratory locations are permissible.

3.6 Provide a substantial platform, constructed to the proper height, for use in obtaining asphalt mix samples and inspection of mixtures in truck beds.

3.7 **Notify the Asphalt Materials Engineer, in writing, when the lab is ready for initial inspection**. After initial inspection, the laboratory will be checked for recertification yearly.

3.8 A representative of the Asphalt Materials Engineer will perform an inspection and verify that the lab complies with current standard specifications, and the attached checklist. During the inspection, ensure that a Quality Control Manager or representative is present to certify that all equipment is present and that by signing Form SC-M-404A, they are guarantying that all equipment will remain in the laboratory and will be calibrated or verified as required by **AASHTO R 18**.

3.9 Upon meeting all requirements for approval, a yearly approval decal will be placed at a suitable location inside the field laboratory. If at any time all requirements are not met, the approval may be revoked.

**Asphalt Field Laboratory Checklist**
Attachment to SC–M-404 (06/07)

## I. CONTRACTOR INFORMATION:

Asphalt Contractor: _____ Plant Location: _____

Contractor's Representative: _____

Contractor's Signature: _____

Date Inspected: _____ Inspected by: _____

Next Inspection Due Date: _____ District: _____

## II. LAB STRUCTURE

YES☑ or NO ☒

Size and type of structure:
Floor space _____(min. 250 sq ft.)

Height _____ Width _____

Type of Structure _____

| | |
|---|---|
| Is the plant in full view and close proximity from one of the windows of the laboratory? | ☐ |
| Is sufficient water available for all tests? | ☐ |
| Is sufficient and satisfactory furniture for office work provided? | ☐ |
| Are satisfactory electric lighting and electric outlets provided? | ☐ |
| Are suitable worktables and/or benches provided? | ☐ |
| Are locks provided for the windows and doors? | ☐ |
| Is there sufficient ventilation from solvents and other chemicals if applicable? | ☐ |
| Is the field laboratory equipped so that the temperature inside the laboratory can be maintained between 65 – 80 ° F? | ☐ |

## III. EQUIPMENT

1. Ignition Oven (Meeting requirements of **SC-T-75**) ☐

2. Gyratory Compactor (meeting requirements of **AASHTO T 312**) including calibration kit (pressure / angle / height / rotation) ☐
   a) Four (4) Compaction Molds
   b) 6" Compaction Mold Holder
   c) Gyratory Specimen Protection Paper Discs
   d) Garden spade minimum 2" wide
   e) Flat spade ¾" wide and 6" long
   f) Extractor jack assembly

3. Complete Marshall Apparatus (not needed if only gyratory mix designs are approved): ☐
   a) Automatic Compaction Hammer (meeting **AASHTO T 245**)
   b) Four (4) Compaction Molds
   c) 4" Compaction Mold Holder
   d) Marshall
   e) Marshall Specimen Protection Paper Discs
   f) Hot Plate
   g) Sand bath for Marshall Hammer
   h) Extractor jack assembly - hydraulic type for extruding Marshall specimens

4. Compression and Testing Machine – must have recorder to measure stability and flow – minimum capacity of 10,000 lbs. – capable of testing 4" or 6" specimens. ☐

5. Water bath capable of maintaining a constant temperature of 140°F ± 1.8°F (60 ± 1°C) throughout the entire volume of the bath. Water bath meets testing standards specified in **SC-T-66**. ☐

6. Water bath equipped with a water circulator capable of maintaining a constant temperature of 77°F ± 1.8°F (25 ± 1°C) throughout the entire volume of the bath. Water bath meets the testing standards specified in **SC-T-68**. ☐

7. Maximum Gravity Equipment (Ref. **SC-T-83**):
   a) Vacuum pump capable of pulling a vacuum of less than 30mm Hg from daily absolute pressure within 2 minutes of beginning the test.
   b) Pycnometer or metal container having a capacity of at least 2,000 ml.
   c) Ensure that the container has a cover fitted with a rubber gasket and a hose connection. Ensure that the hose opening is covered with a small piece of No. 200 wire mesh to minimize the possibility of loss of fine material
   d) At least one (1) liter flask to be used as a water vapor trap
   e) Calibrated gauge and/or manometer installed in-line to monitor vacuum.
   f) Kraft brown paper, or equivalent, for preparation of sample approximately 3' x 3'

8. Masonry saw equipped with a diamond tip blade and water-cooling system. Ensure that the Masonry saw is capable of slicing a 6 inch diameter core in one pass without disturbing the structure of the core ☐

9. Double-walled convection laboratory oven with an inside volume of at least 2.5 cubic feet. Oven is capable of maintaining a temperature of 230°F ± 9°F (110°C± 4.4°C) - Drying Oven. ☐

10. Double-walled thermostatic-controlled forced-air laboratory oven with a minimum inside volume of 5.0 cubic feet. Oven is capable of maintaining a temperature of 295°F ± 5°F (146°C ± 2.5°C) – Mold Oven. ☐

11. Two (2) Buckets of adequate size (approximately 5 gallons) for sampling asphalt mix from the truck

12. Sample quartering table of minimum size 3' x 3' and accessible from at least two sides. ☐

13. One (1) Large mason trowel. ☐

14. Sample splitter with a minimum of 8 chutes each 2 inches wide with minimum of 3 splitter pans. ☐

15. Large motor driven shaker complete with screens of suitable sizes for running large stockpile samples (Gilson TS-1, TM-1 or equivalent) ☐
Following sieves required for the large shaker:
1½", 1", ¾", ½", #4, #8 and bottom pan.

16. 8" or 12" sieve shaker for running HMA gradation samples. (Ro-Tap design or Mary-Ann style) - Must have a tapping device. ☐
Also must have the following sieves for the 8 or 12 inch shaker:
1", ¾", ½", 3/8", #4, #8, #30, #100, # 200 and bottom pan

17. Suitable Sieve Brushes ☐

18. One (1) Wash #200 sieve with protective #16 sieve along with sampling pans / pots needed to perform washed gradations ☐

19. One (1) Milk Scale (Scale shall have a maximum capacity of at least 30 pounds and should be in 0.1 pound increments) for lime rate determination or equivalent. – **SC-T-71** only ☐

20. Four (4) certified 50 pounds weights - **SC-T-78** only ☐

21. Two (2) 12K electronic balances accurate to 0.1 grams. ☐

22. Water softener: **Note: Do <u>not</u> use softener with oil beads** ☐

23. Cloth Towel – Water absorbent for bulk gravity specimens ☐

24. Two (2) calibrated timers ☐

25. Thermometers ☐
    a) Five (5) Dial Thermometers (50 – 400 degrees Fahrenheit) for plant and road inspectors.
    b) One (1) 140°F Mercury Thermometer (Such as ASTM 20F or ASTM 45F – NIST traceable)
    c) One (1) 77°F Mercury Thermometer (Such as ASTM 17F or ASTM 47F – NIST traceable)
    d) One (1) 300°F Thermometer – (Mercury or Thermocouple- NIST traceable)
    e) Weather Thermometer

26. Penetrating Oil ☐

27. Fax machine and telephone for business use by the plant technician or SCDOT personnel. ☐

28. A certified caliper readable to 0.01 mm along with an eye comparator with 0.1mm scale (required for verification procedure) ☐

29. A brass thermometer well (for verification procedure) ☐

30. Cloth sample bags – enough for verification and referee samples (as needed during production) ☐

**IV. CALIBRATION RECORDS**

YES ☑ OR NO ☒

1. Ignition oven calibrations for individual job mixes posted or filed in the field laboratory? ☐

2. Ignition oven calibration performed on a monthly basis? ☐

3. Calibration records available in the field lab? ☐

4. Equipment calibrations up to date? ☐
    a) Marshall Hammer – (if applicable)?
    b) Gyratory Compactor?
    c) Molds (Marshall and Gyratory)?
    d) Heating Ovens?
    e) Water Baths?
    f) Timers
    g) Vacuum System?
    h) Thermometers?
    i) Sieves?
    j) Sieve Shakers?

**REMARKS:**