

Supplemental Technical Specification for

Inspection and Acceptance of Asphalt Mix Design Laboratories

SCDOT Designation: SC-M-405 (05/1/14)

1. SCOPE

- 1.1 This specification covers the process for inspection and acceptance of asphalt mix design laboratories used for designing SCDOT asphalt mixtures. This will not be used as a safety inspection. The Contractor is responsible for maintaining the safety requirements for the asphalt mix design labs.

2. REFERENCED DOCUMENTS

- 2.1 AASHTO Standards
- 2.1.1 R18, R30
- 2.2 SCDOT Test Methods
- 2.2.1 SC-T-68, SC-T-70, SC-T-77, SC-T-83, SC-T-88, SC-T-90, SC-T-96, SC-T-102

3. REQUIREMENTS FOR ALL MIX DESIGN LABORATORIES

- 3.1 Provide all required laboratory equipment listed on the asphalt mix design lab checklist listed herein, and ensure that all equipment meets requirements specified in the standard specifications and any supplemental specifications for all mixes.
- 3.2 After initial inspection, the laboratory will be checked for recertification yearly. Notify the Asphalt Materials Engineer when the mix design laboratory is ready for initial inspection.
- 3.3 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 the attached laboratory equipment checklist, they are ensuring that all equipment will remain in the laboratory and will be calibrated or verified as required by **AASHTO R 18**.
- 3.4 Upon meeting all requirements for approval, a yearly approval decal will be placed at a suitable location inside the laboratory. If at any time all requirements are not met, the approval may be revoked.
- 3.5 Substitution of AMRL lab accreditation will be accepted in lieu of SCDOT annual inspection if the laboratory maintains certification with a minimum of the following certifications: R18, T166, T209, T269, T283, and T312.

Asphalt Mix Design Laboratory Checklist

Attachment to SC-M-405

I. CONTRACTOR INFORMATION:

Asphalt Contractor: _____ Lab Location: _____

Contractor's Representative: _____

Contractor's Signature: _____

Date Inspected: _____ Inspected by: _____

Next Inspection Due Date: _____ SCDOT Cert. # _____

II. LAB STRUCTURE

YES or NO

Is sufficient water available for all tests?

Are satisfactory electric lighting and electric outlets provided?

Are suitable worktables and/or benches provided?

Is the laboratory equipped so that the temperature inside the laboratory can be maintained between 65° – 80°F?

III. EQUIPMENT

1. Gyratory Compactor (meeting requirements of **SC-T-103**) including calibration kit (pressure / angle / height / rotation), and an extraction jack.
 - a) Four (4) Compaction Molds (150mm)
 - b) Printer or USB device for file transfer for printing heights of specimens
 - c) 150mm ITS – Tensile Strength Head (**SC-T-70**)
 - d) 150mm Compression Mold Breaking Head (**SC-T-96**)
 - e) Curing pans for specimens that meet **AASHTO R30** (capable of spreading the mixture at maximum of 2" deep)
 - f) Gyratory specimen protection disk – 150mm diameter
 - g) Garden spade minimum 2" wide
 - h) Flat spade ¾" wide and 6" long

Make: _____ Model / Serial No: _____

Internal angle: _____ ° Date Last Calibrated: _____

2. Compression and Testing Machine – must have recorder to measure stability and flow – minimum capacity of 10,000 lbs. – capable of testing 150mm specimens. **(SC-T-70 and SC-T-96)**
 Brand _____ Serial # _____ Model # _____
3. Hot water bath capable of maintaining a constant temperature of 140°F ± 1.8°F throughout the entire volume of the bath. Water bath meeting testing standards specified in **(SC-T-70 and SC-T-96)**.
 Brand _____ Serial # _____ Model # _____
 Brand _____ Serial # _____ Model # _____
4. Cold water bath equipped with a water circulator capable of maintaining a constant temperature of 77°F ± 1.8°F throughout the entire volume of the bath. Water bath should meet the testing standards specified in **(SC-T-68 and SC-T-70)**.
 Brand _____ Serial # _____ Model # _____
 Brand _____ Serial # _____ Model # _____
5. Maximum Gravity Equipment **(SC-T-83)**:
 a) Vacuum pump capable of pulling less than 30mm Hg from daily atmospheric pressure within 2 minutes of beginning the test.
 Brand _____ Serial # _____ Model # _____
 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.
 d) At least one (1) liter flask or desiccator to be used as a water vapor trap.
 e) Calibrated gauge and manometer (digital or mercury) installed in-line to monitor vacuum.
 f) Kraft paper, or equivalent, for preparation and cooling of sample approximately 3' x 3'
 g) Vibrating mechanism or table for constant agitation throughout entire test.
 Brand _____ Serial # _____ Model # _____
6. Double-walled convection laboratory oven with an inside volume of at least 2.5 cubic feet. This oven should be capable of maintaining a temperature of 230°F ± 9°F - **Drying Oven**.
 Brand _____ Serial # _____ Model # _____
7. 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 – **Mold Oven**.
 Brand _____ Serial # _____ Model # _____

8. Double-walled thermostatic-controlled forced-air laboratory oven with a minimum inside volume of 12.0 cubic feet. Oven should be capable of maintaining a temperature of 350°F ± 5°F – **Heating Oven.**
 Brand _____ Serial # _____ Model # _____
9. Sample splitter with a minimum of eight chutes with a minimum of 3 splitter pans. (Fine Aggregate)
 Brand _____ Serial # _____ Model # _____
10. Sample splitter with a minimum of 8 chutes, each 2" wide with a minimum of 3 splitter pans. (Coarse Aggregate)
 Brand _____ Serial # _____ Model # _____
11. Large motor-driven shaker complete with screens of suitable sizes. (Gilson TS-1, TM-1 or equivalent) – used to separate materials for design specimens
 Brand _____ Serial # _____ Model # _____
12. The following sieves required for the large shaker:
 1½", 1", ¾", ½", #4, #8 and bottom pan
13. 12" sieve shaker. **(SC-T-102)** (Ro-Tap design or Mary-Ann style) - Must have a tapping device
 Brand _____ Serial # _____ Model # _____
14. The following sieves are required for the 12 inch shaker:
 1", ¾", ½", 3/8", #4, #8, #30, #100, # 200 and bottom pan
15. Suitable Sieve Brushes – at least one brass or steel and one nylon.
16. One (1) Wash #200 sieve with protective #16 or #8 sieve along with sampling pans / pots needed to perform washed gradations.
17. Certified calipers capable of measuring up to 6" and accurate to (0.001").
 Brand _____ Serial # _____ Model # _____
18. Eye Comparator or magnifying glass for fine sieve inspection / verification of condition.
19. Two (2) calibrated timers
 Brand _____ Serial # _____ Model # _____
 Brand _____ Serial # _____ Model # _____
20. Two (2) 12K electronic balances accurate to 0.1 grams.
 Brand _____ Serial # _____ Model # _____
 Brand _____ Serial # _____ Model # _____

21. Thermometers
- **140°F** Glass Thermometer (such as a ASTM 20F or ASTM 45F– NIST traceable or Thermocouple)
Brand _____ Serial # _____ Model # _____
 - **77°F** Glass Thermometer (such as a ASTM 17F or ASTM 47F– NIST traceable or Thermocouple)
Brand _____ Serial # _____ Model # _____
 - **300°F** Glass Thermometer – (or Thermocouple- NIST traceable)
Brand _____ Serial # _____ Model # _____
22. Water Softener (i.e. Calgon without oil beads), HMA water softener or compatible. (Not dish detergent.)
23. Bowls or pans for batching aggregates – minimum of 10
24. Graduated cylinder or beaker for accurately adding water to batched samples with Hydrated Lime
25. Dispensing pot for heating asphalt binder or tongs to distribute binder
26. Mechanical Mixer – 12 quarts or larger or bucket mixer
27. OGFC drain-down basket – necessary for OGFC designs (**SC-T-88 and SC-T-90**).
28. Penetrating Oil or lubrication grease for gyratory and other equipment.
29. Cloth Towel – Water absorbent for bulk specific gravity specimens
30. Insulated Gloves

IV. CALIBRATION and MAINTENANCE RECORDS (recommend using AASHTO R-18 schedule)

YES OR NO

1. Calibration records available in the lab?
2. Calibration records kept neat and legible and according to SC-Verification or Check procedures?
3. Equipment calibrations up to date?
4. Equipment maintenance records on file?

REMARKS:
