

State of Illinois
Department of Transportation
Bureau of Materials and Physical Research

POLICY MEMORANDUM

Revised: June 6, 2014

6-08.1

This Policy Memorandum supersedes number 6-08.0 dated January 1, 2008

TO: REGIONAL ENGINEERS AND HIGHWAY BUREAU CHIEFS
AGGREGATE, HOT-MIX ASPHALT (HMA), AND
PORTLAND CEMENT CONCRETE (PCC) PRODUCERS

SUBJECT: MINIMUM PRIVATE LABORATORY REQUIREMENTS FOR
CONSTRUCTION MATERIALS TESTING OR MIX DESIGN

1.0 **DEFINITIONS**

AASHTO R 18 - The American Association of State Highway and Transportation Officials (AASHTO) Standard for "Establishing and Implementing a Quality System for Construction Materials Laboratories." The principles of AASHTO R 18 are used by the Bureau of Materials and Physical Research (BMPR) to administer the qualified laboratory program for **District** and **Private Laboratories**.

ACCREDITED LAB – A laboratory that is currently accredited by the AASHTO Accreditation Program (AAP) or other accrediting body recognized by FHWA.

BMPR LABORATORY - The Department's central laboratory maintained and operated by the Bureau of Materials and Physical Research (BMPR). The BMPR Laboratory administers the qualified laboratory program for **District** and **Private Laboratories**.

CONSULTANT - A Private firm which performs construction materials testing for the **Department, Producer, or Contractor**. **Department** prequalification and AASHTO accreditation requirements apply where **Department** construction testing is performed directly for the **Department** under a **Department** contract or subcontract.

CONTRACTOR - The individual, firm, partnership, joint venture, or corporation contracting with the **Department** for performance of prescribed work.

DEPARTMENT – Illinois Department of Transportation (IDOT), including its Districts and Central Bureau offices.

DISTRICT LABORATORY - A **Department** laboratory that is operated by a District.

FIELD TESTS – Tests that may be performed outside of a laboratory, for example, a portland cement concrete (PCC) or hot-mix asphalt (HMA) test performed at the jobsite.

HMA MIX DESIGN LABORATORY – Any **Private Laboratory** that has a **Department** approved HMA mix design lab. Consultants that are prequalified with the **Department** for HMA Mix Design must be capable of performing the tests listed in Table 1 under HMA Design.

PRIVATE LABORATORY - Any construction materials testing or design laboratory not operated by the **Department**. This includes **Contractor**, **Producer**, or **Consultant** laboratories performing Quality Control (QC), Quality Assurance (QA), acceptance, independent assurance, or any other required or contracted testing on a **Department** project.

PRODUCER - An individual or business entity providing materials for performance of prescribed work.

QUALIFIED LABORATORIES – Laboratories that are inspected and approved by the **Department**. FHWA’s Construction regulations (23 CFR 637.203) define these as *Laboratories that are capable as defined by appropriate programs established by each state transportation department. As a minimum, the qualification program shall include provisions for checking test equipment, and the laboratory shall keep records of calibration checks.*

QUALIFIED PERSONNEL - Personnel with demonstrated and documented capability to perform the applicable inspection and testing. The minimum requirement for aggregate, hot-mix asphalt (HMA), or Portland cement concrete (PCC) testing is successful completion of the prescribed **Department** Quality Control/Quality Assurance (QC/QA) Trained Technician classes. (Note: Additional personnel or experience requirements may apply to labs performing professional service work for the **Department**, e.g. Professional Engineer (P.E.) registrations, resumes, documented experience. When required, such notice will be provided in the prequalification process or solicitation notice.)

QUALITY ASSURANCE TESTING CONSULTANT – A Professional Engineering firm that is prequalified by the **Department** to perform field and/or laboratory tests for the **Department**. Required tests for quality assurance testing consultants are listed in Table 2.

QUALITY ASSURANCE LABORATORY - Any laboratory used for Quality Assurance (QA) testing (**Department** tests) required by the **Department**. Required tests for quality assurance laboratories are listed in Table 2.

QUALITY CONTROL LABORATORY - Any laboratory used for Quality Control (QC) testing (**Contractor** or **Producer** tests) required by the **Department**. Required tests for quality control laboratories are listed in Table 1.

QUALITY CONTROL (QC) MANAGER – An employee (or **Consultant**) of a **Contractor** or **Producer** who is responsible for compliance with the QC/QA requirements in a **Department** contract or policy.

TECHNICAL MANAGER - The individual with responsibility for the overall operations, condition, and maintenance of the **Private Laboratory**. The Technical Manager shall be identified in writing. The Technical Manager is not required to be the **QC Manager** defined in the contract. However, the Technical Manager shall be familiar with the Quality Control (QC) testing requirements and the specified equipment.

2.0 SCOPE

This policy governs the minimum qualifications for materials **Quality Control and Quality Assurance Laboratories** operated by **Contractors, Producers and Consultants**. It applies to aggregate, hot-mix asphalt (HMA) and Portland cement concrete (PCC) testing laboratories.

3.0 PURPOSE

- To ensure that **Private Laboratories** are equipped and maintained at a uniform and high level of quality.
- To establish a uniform procedure for evaluating and approving **Private Laboratories**.
- To maintain a uniform standard for inspecting test equipment and test procedures.

4.0 AUTHORITY

Federal regulations (23 CFR Part 637) require the **Department** to establish a program for "qualifying" construction laboratories involved in tests which are used for acceptance. Under the **Department's** QC/QA specifications, **Contractor/Producer** test results are used in the acceptance process

5.0 REFERENCE DOCUMENTS

- IDOT *Standard Specifications for Road and Bridge Construction*.
- IDOT *Manual of Test Procedures for Materials*.
- IDOT QC/QA Specifications for Hot-Mix Asphalt and Portland Cement Concrete.
- AASHTO, ASTM, and IDOT Test Procedures.
- Code of Federal Regulations (23 CFR Part 637).
- **Department** Policy MAT-15, "Quality Assurance Procedures for Construction."

6.0 PRIVATE LABORATORY REQUIREMENTS

6.1 **Personnel Qualifications/Responsibilities**

6.1.1 All testing for **Department** contracts shall be performed by **Qualified Personnel** as specified in the contract.

6.1.2 The **Department** will maintain a computer database of **Qualified Personnel** who have successfully passed the appropriate QC/QA classes.

6.2 **Facilities and Equipment**

6.2.1 The **Department** shall approve all **Private Laboratories** used on **Department** projects.

- 6.2.2 Each **Private Laboratory** shall maintain the equipment and facilities necessary to perform the tests as appropriate for the product to be tested. A list of required **Private Laboratory** tests is provided in Tables 1 and 2.
- 6.2.3 Each **Private Laboratory** shall have adequate floor space to efficiently conduct required tests. Suggested minimum floor space is provided under “Model Quality Control Plans” in the Manual of Test Procedures for Materials.
- 6.2.4 Each **Private Laboratory** shall have HVAC equipment capable of maintaining a room temperature of 20 to 30° C (68-86° F). A **Private Laboratory** that performs only aggregate gradation and/or aggregate moisture testing is exempt from this requirement.
- 6.2.5 All equipment shall be as specified in the current Manual of Test Procedures for Materials.

7.0 **QUALITY SYSTEM CRITERIA**

7.1 **AASHTO R 18**

Each **Private Laboratory** shall establish and implement a quality system which meets the criteria from **AASHTO R 18**. Accredited Laboratories shall comply with all of **AASHTO R 18** for AMRL, and ASTM C 1077 for CCRL, with the exception of Sections 6.1.7.4 and Section 6.1.7.5 of ASTM C 1077. The **Private Laboratory** shall document staff technical proficiency in line with the requirements of AASHTO R-18 section 5.5.2.

7.2 **Technical Manager**

Each **Private Laboratory** shall have a **Technical Manager** (however titled) who has overall responsibility for the technical operations of the **Private Laboratory**. The **Technical Manager** shall be responsible for equipment maintenance and calibration, maintaining records, and ensuring that current test procedures are utilized. If the **Private Laboratory** is prequalified in a Professional **Consultant** service category, a licensed Illinois Professional Engineer shall have direct supervision of the laboratory.

7.3 **Equipment Calibration and Verification**

The **Private Laboratory** shall calibrate or verify all testing equipment associated with tests performed by the **Private Laboratory**. Table 3 includes a maximum interval for calibrating most laboratory equipment. Heavy use or specific test requirements may justify more frequent checks.

7.4 **Proficiency Testing**

Private Laboratory qualifications may include round-robin proficiency testing conducted by the **Department**. Results of proficiency testing may be considered in the overall evaluation of the **Private Laboratory** to conduct specific tests.

7.5 Records

7.5.1 Test Records – Each **Private Laboratory** shall maintain test records which contain sufficient information to permit verification of any test report.

7.5.2 Records Retention - Each **Private Laboratory** shall maintain documentation of the internal quality controls. At a minimum, the records shall include:

- Documentation of assignment of personnel responsible for internal quality controls.
- Documentation of equipment calibration.
- Logs of sample pick-up shall be maintained for a minimum period of three years.
- All documentation shall be maintained and available to **Department** inspection for a period of three years.

7.5.3 Equipment Calibration and Verification Records - Calibration records shall include the minimum information listed below. **AASHTO R 18** and ASTM Standard C 1077 provide additional guidance for calibration of most testing equipment.

1. Description
2. Model & Serial Number
3. Name of person calibrating
4. Calibration equipment used
(e.g., standard weights, proving rings, thermometers)
5. Date calibrated & next due date
6. Reference procedure used
7. Results of calibration / verification

7.5.4 Proficiency Sample Records – Each **Private Laboratory** shall retain results of participation in any proficiency sample program, including the documentation of steps taken to determine the cause of poor results and corrective action taken.

7.6 Publications

Each **Approved Private Laboratory** shall maintain current copies of all test procedures performed. This requirement shall include a current copy of the Manual of Test Procedures for Materials.

8.0 LABORATORY INSPECTIONS

8.1 General

The **Department** will approve **Private Laboratories** by inspection.

- AGGREGATE LABORATORIES - Initial inspections and re-inspections will be performed by the District.
- OTHER LABORATORIES - Initial inspections are performed by the **Bureau of Materials and Physical Research**. Re-inspections are performed by the District.

8.2 AASHTO Accredited Private Laboratories

8.2.1 Current AASHTO accreditation of the **private** laboratory is a prerequisite for **Consultant** prequalification as a **Quality Assurance Testing Consultant**. Conditions for prequalification may be found in the prequalification instructions and forms.

AASHTO accreditation does not waive the right of the **Department** to conduct inspections and/or re-inspections.

8.3 Initial Inspection

- Facilities - Physical and environmental conditions.
- Equipment - Test apparatus for specification compliance.
- Documentation - Calibration and verification records.
- Personnel - A review of qualified personnel credentials.
- Observation - The **Private Laboratory** may be required to demonstrate **Required Tests**. Some test procedures, such as field tests, may be evaluated through discussion with laboratory personnel.
- Report - The **Private Laboratory** will be provided with a report listing those tests for which it is approved. The report will note deficiencies.

8.4 Initial HMA and PCC Laboratory Inspections

8.4.1 The **Private Laboratory** shall submit a written request for an inspection to the District. The request shall indicate the following:

- The location of the **Private Laboratory**.
- The type of **Private Laboratory**, i.e., aggregate, HMA, or PCC.
- The name of the **Technical Manager**, who will be present for the inspection.
- The date the **Private Laboratory** will be ready for inspection.

8.4.2 The District will notify the **BMPR Laboratory** of the inspection request. **BMPR** personnel will establish a tentative date to perform the inspection.

8.4.3 The District will perform a brief visual inspection approximately seven calendar days before the **BMPR** inspection. The District will verify that the **Private Laboratory** is ready for inspection and notify the **BMPR Laboratory**.

8.4.4 **BMPR** personnel will perform the inspection and prepare a preliminary report. Standard inspection forms and a preliminary report, developed and maintained by the **BMPR Laboratory**, will be used.

8.4.5 **BMPR** personnel will assign identification numbers to all test equipment. Unless a District has an established numbering system, the following sequences will be used.

Sieves

e.g., IL07 -1418-01

where: IL = State

07 = inspection year

1418-01 = Producer/Supplier Number

Sieves are engraved on the inside of the bottom lip directly beneath the label.

HMA Equipment

e.g., IL07B1 - 123

where: IL = State

07 = inspection year

B = hot mix asphalt (bituminous)

1 = district number

123 = sequential numbers

PCC Equipment

e.g., IL07C1 - 123

where: IL = State

07 = inspection year

C = concrete

1 = district number

123 = sequential numbers

*The numbering system prior to 2007 was IL07-123 for HMA and IL07CND1-123 for PCC. The change was made to make the numbering system more uniform.

8.4.6 **BMPR** personnel will perform a close-out with the **Technical Manager** and the District representative. The **Technical Manager** and the District will be given a copy

of the preliminary report.

- 8.4.7** If a review of the preliminary report indicates there are no deficiencies, **BMPR** will provide written notification to the **Private Laboratory** indicating the **Private Laboratory** is now an approved private laboratory. The notification will include an equipment list. A copy of the notification will be provided to the District.
- 8.4.8** If the preliminary report indicates there are deficiencies, **BMPR** will provide written notification to the **Private Laboratory**, indicating the deficiencies and that corrective action is required. A copy of the written notification will be provided to the District.
- 8.4.9** After correction of all cited deficiencies, the **Private Laboratory** shall notify the District. The District will inspect the **Private Laboratory** to verify the deficiencies have been corrected and will notify **BMPR** in writing.
- 8.4.10** **BMPR** will provide written notification to the **Private Laboratory**, indicating the private laboratory is now an approved private laboratory. The notification will include an equipment list. A copy of the written notification will be provided to the District.
- 8.4.11** Uncorrected deficiencies will not be waived. Equivalent equipment specifications may be approved only with the written approval of **BMPR's** Engineer of Tests.

8.5 Initial Aggregate Laboratory Inspection

For an aggregate **Private Laboratory**, the procedures outlined in 8.4 shall be followed, except District personnel will perform the inspection instead of personnel from **BMPR**.

8.6 Re-Approval of Approved Private Laboratories

- 8.6.1** The re-inspection of **Private Laboratories** shall be conducted at intervals deemed appropriate by the District. The interval between inspections shall not exceed two calendar years. The District's evaluation may include the following:
- Physical inspection of the laboratory facility and equipment.
 - Review of the **Private Laboratory's** internal quality plan and documentation in accordance with this policy and those parts of **AASHTO R 18** incorporated by this policy.
 - Observations of tests performed by qualified personnel.
 - Results of split sample testing between the **Private Laboratory** and the District.
 - Results of proficiency sample testing programs conducted by the **Department**.
 - Overall past performance and experience.
- 8.6.2** The District may not waive any requirements for **Private Laboratories** or test equipment for **Required Tests**.
- 8.6.3** The District shall issue a letter of re-approval to the **Private Laboratory**, or provide a written and itemized deficiency list. The **Private Laboratory** shall notify the District when deficiencies are corrected and ready for re-inspection.

8.6.4 At any time, if the District identifies deficiencies in the facility, equipment, or test procedures that could affect the results of any QC or QA tests, the District will require the **Private Laboratory** to take immediate action to correct the deficiency.

9.0 **EXEMPTIONS – AMRL**

If a **Private Laboratory** maintains current accreditation from AMRL for the appropriate test procedures, the District may waive the re-inspection requirements of this policy. To enact the waiver, the **Private Laboratory** must provide copies of inspection reports and proficiency sample results to the District. This waiver does not apply to the initial inspection requirements, including the required equipment list.

10.0 **LABORATORY DATABASE**

The **Department** will maintain a computer database to monitor the approval status of **Private Laboratories**. The database will include the following information:

- Laboratory Codes (Department, Producer, etc.)
- Responsible District
- Type Laboratory (Aggregate, HMA, PCC, Other)
- Demographics (Address, etc.)
- Date Inspected
- Approval Status



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Attachments

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TABLE 1
PRIVATE LABORATORY TESTS

AGGREGATE TESTS	<u>PROCEDURE</u>		<u>PRIVATE LAB TYPE</u>				<u>DESCRIPTION</u>
	AASHTO (Illinois Modified)	ASTM	AGG	HMA QC	HMA DESIGN	PCC QC	
	T 2 (IL)		√	√	√	√	Sampling of Aggregates
	T 11 (IL)		√	√	√	√	Materials Finer Than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
	T 19 (IL)		√ ¹			√	Unit Weight and Voids in Aggregate
	T 27 (IL)		√	√	√	√	Sieve Analysis of Fine and Coarse Aggregates
	T 84 (IL)		√ ²				Specific Gravity and Absorption of Fine Aggregate
	T 85 (IL)		√ ²				Specific Gravity and Absorption of Coarse Aggregate
	T 248 (IL)		√	√	√	√	Reducing Field Samples of Aggregate to Testing Size
	T 255 (IL)		√	√	√	√	Total Moisture Content of Aggregate by Drying

Note 1: Required for laboratories that test Air Cooled Blast Furnace Slag.

Note 2: Required for laboratories that run the Department's Slag Producers' Self-Testing Program.

TABLE 1 (CON'T)

PRIVATE LABORATORY TESTS

HOT-MIX ASPHALT TESTS	PROCEDURE		PRIVATE LAB TYPE				DESCRIPTION
	AASHTO (Illinois Modified)	ASTM	AGG	HMA QC	HMA DESIGN	PCC QC	
	T 30 (IL)				√		Mechanical Analysis of Extracted Aggregate
	T 164 (IL)			√ ¹ Or T287 or T308 ²	√ ¹		Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
	T 166 (IL)			√	√		Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
	T 209 (IL)			√	√		Maximum Specific Gravity of Bituminous Paving Mixtures
	T 245 (IL)						Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
	T 283 (IL)				√		Resistance of Compacted Bituminous Mixture to Moisture Induced Damage
	T 287 (IL)			√ Or T164 or T 308 ²			Asphalt Content of Bituminous Concrete Mixtures by the Nuclear Method
	T 312 (IL)			√	√		Superpave Gyrotory Compaction
T 308 (IL)			√ or T164 or T 287 ²	√		Asphalt Binder Content of Hot-Mix Asphalt by the Ignition Method	
_____	D 2950 (IL)		√			Determination of Density of Bituminous Concrete In-Place by Nuclear Method – Field Test; not observed during Lab Inspection	

Note 1: Method B shall be used for quantitative extraction. Method A or E shall be used to recover binder for qualitative analysis.

Note 2: Determined by which piece of equipment is more appropriate for the lab to determine asphalt content.

TABLE 1 (CON'T)

PRIVATE LABORATORY TESTS

PORTLAND CEMENT CONCRETE TESTS

PROCEDURE		PRIVATE LAB TYPE				DESCRIPTION
AASHTO (Illinois Modified)	ASTM	AGG	HMA QC	HMA DESIGN	PCC QC	
T 22 (IL)					√ Either T22 or T177.	Compressive Strength of Cylindrical Concrete Specimens
T 23 (IL)					√	Making and Curing Concrete Test Specimens in the Field
T 119 (IL)					√	Slump of Portland Cement Concrete
T 121 (IL)					√	Weight per Cubic Foot, Yield, and Air Content
T 126 (IL)					Required If developing mix designs.	Making and Curing Concrete Test Specimens in the Laboratory
T 141 (IL)					√	Sampling Fresh Concrete
T 152 (IL)					√	Air Content of Freshly Mixed Concrete by the Pressure Method - Type A or B Air Meter
T 177 (IL)					√ Either T22 or T177.	Flexural Strength of Concrete - Hand Pump or Mechanical Breaker
T 196 (IL)						Air Content of Freshly Mixed Concrete by the Volumetric Method
T 231						Capping Cylindrical Concrete Specimens
T 309 (IL)					√	Temperature of Freshly Mixed PCC
IL Test Procedure 301	—					Fine Aggregate Moisture Content by Flask Method
IL Test Procedure 302	—					Fine or Coarse Aggregate Specific Gravity and Moisture Content by Dunagan Method
IL Test Procedure 303	—					Fine or Coarse Aggregate Moisture Content by Pycnometer Jar Method
IL Test Procedure 306					Required If developing mix designs.	Voids Test of Coarse Aggregate for Concrete Mixtures

Note 1: For an exception to the strength testing requirement of performing compressive or flexural testing (example: labs at Concrete Producer Plants), refer to the Department's "Required Sampling and Testing Equipment for Concrete" document and check with district for approval of exception.

**TABLE 2
REQUIRED TESTS – QUALITY ASSURANCE TESTING CONSULTANTS¹**

PROCEDURE		REQUIRED FOR PREQUALIFICATION			DESCRIPTION
AASHTO (Illinois Mod)	ASTM	IDOT QA	AAP On-Site Assessment	AAP Proficiency Assessment	
AGGREGATE	T 2 (IL)		√		Sampling of Aggregates
	T 11 (IL)		√	√	75-µm (No. 200) by Washing
	T 19 (IL)		√	√	Unit Weight and Voids in Aggregate
	T 27 (IL)		√	√	Sieve Analysis of Fine and Coarse Aggregates
	T 84 (IL) ²		√	√	SG and Absorption of Fine Aggregate
	T 85 (IL) ²		√	√	SG and Absorption of Coarse Aggregate
	T 248 (IL)		√	√	Reducing Field Samples Size
	T 255 (IL)		√	√	Total Moisture Content
HOT-MIX ASPHALT	T 30 (IL)		√		Mechanical Analysis of Extracted Aggregate
	T 164 (IL)		√	√	Quantitative Extraction
	T 166 (IL)		√	√	Bulk Specific Gravity
	T 209 (IL)		√	√	Maximum Specific Gravity
	T 245 (IL)				Marshall Stability & Flow
	T 283 (IL)		√	√	Resistance to Moisture Induced Damage
	T 287 (IL)		√ ³		Asphalt Content by the Nuclear Method
	T 312(IL)		√	√	Superpave Gyrotory Compaction
	T 308(IL)		√	√	Asphalt Binder Content by Ignition
	D 2950 (IL)		√		Nuclear Density– Field Test

Note 1: QA labs have the option to be HMA/AGG, PCC/AGG, or HMA/PCC/AGG approved

Note 2: Required for laboratories that run the Department's Slag Producers' Self-Testing Program.

Note 3: Requirement determined on case to case basis by district in which lab is located.

TABLE 2 (CON'T)
REQUIRED TESTS – QUALITY ASSURANCE TESTING CONSULTANTS¹

	PROCEDURE		REQUIRED FOR PREQUALIFICATION			DESCRIPTION
	AASHTO (Illinois Mod)	ASTM	IDOT QA	AAP On-Site Assessment	AAP Proficiency Assessment	
CONCRETE	R39 (IL)				√	Making and Curing Test Specimens in the Laboratory
	T 22 (IL)		√	√	√	Compressive Strength of Cylinders
	T 23 (IL)		√	√	√	Making and Curing Test Specimens in the Field
	T 119 (IL)		√	√	√	Slump
	T 121 (IL)		√	√	√	Weight, Yield, and Air Content
	T 141 (IL)		√	√		Sampling Fresh Concrete
	T 152 (IL)		√	√	√	Air Content-Type A or B Pressure Method
	T 177 (IL)		√	√ ²		Flexural Strength of Concrete - Hand Pump or Mechanical Breaker
	T 196 (IL)		3	3	5	Air Content by Volumetric Method
	T 231 (IL)		3	3		Capping Cylinders
	T309 (IL)		√	√		Temperature of Freshly Mixed PCC
	IL Test 301		3			FA Moisture by Flask Method
	IL Test 302		3			FA or CA Aggregate SG and Moisture - Dunagan
	IL Test 303		3			FA or CA Moisture Content by Pycnometer Jar Method
	IL Test 306		4			Voids Test of CA for Concrete Mixtures

- Note 1: QA labs have the option to be HMA/AGG, PCC/AGG, or HMA/PCC/AGG approved.
- Note 2: The AAP on-site assessment is not required for Illinois type portable beam breakers but is required for all other types of beam breakers. Additional Information regarding use of portable PCC labs and their approval is provided In Department Policy MAT-15, "Quality Assurance Procedures for Construction".
- Note 3: Test equipment must be presented during an inspection if the consultant lab has the ability to perform the test.
- Note 4: Test equipment must be presented during an inspection if consultant lab has the ability to verify PCC mix designs.
- Note 5: Test must be performed if consultant lab has the ability to perform the test.

TABLE 3¹

EQUIPMENT CALIBRATION SCHEDULE

EQUIPMENT	REQUIREMENT	MAXIMUM INTERVAL (MONTHS)
Aggregate & General		
Unit Weight Measures	Standardize	12
General Purpose Balances, Scales, Weights	Standardize	12
Mechanical Shakers	Check Sieve Thoroughness	12
Ovens	Standardize Thermometric Device	12
Sieves	Check Physical Condition	6
Thermometers	Calibrate	6
PCC		
Air Meters (Pressure Type)	Standardize During Use	3 (Type B)
	Standardize	12 (Type A)
Air Meters (Volumetric Type)	Standardize	12
Compression & Flexural Testing Machine	Standardize	12
Capping Material	Check Strength	3 or New Shipment
Slump Cones	Check Critical Dimensions	12
Reusable Molds	Check Critical Dimensions	12
Single Use Molds	Check Dimensions	Each Shipment
Moist Room/Storage Tanks Recording Thermometer or Max/Min Thermometer	Standardize	6 Months
HMA		
Gyratory Compactor	Calib. Angle, Pressure, Ht.	1 During use
Base Plates, Ram Face, Molds	Check Critical Dimensions	12
Marshall Hammer	Check Physical Condition	12
	Standardize	36
Ignition Furnace	Standardize	Each mix
Vacuum Pump	Check Pressure	12
Tensile Strength Machine	Standardize	12
Timers	Check Accuracy	6
Molds, Breaking Heads	Check Critical Dimensions	12
Pycnometers	Check Critical Dimensions & Physical Condition	12
Mixers, Bituminous	Check Physical Condition	12
Water Baths	Standardize	8
Extraction Equipment	Check Physical Condition	12

Note 1: See AASHTO R18 for equipment calibration terminology definitions