

State of Illinois
Department of Transportation
Bureau of Materials
Springfield

POLICY MEMORANDUM

Revised: February 8, 2019

29-11.3

This Policy Memorandum supersedes number 29-11.2 dated June 21, 2013

TO: REGIONAL ENGINEERS AND BUREAU CHIEFS IN THE OFFICE OF
HIGHWAYS PROJECT IMPLEMENTATION AND PRIVATE ASR TESTING
LABORATORIES

SUBJECT: MINIMUM PRIVATE LABORATORY REQUIREMENTS FOR ALKALI-SILICA
REACTIVITY (ASR) TESTING

1.0 SCOPE

This policy governs the minimum qualifications for **Private ASR Testing Laboratories** operated by **Contractors, Producers** and **Consultants** that conduct ASR tests.

Private ASR Testing Laboratories shall be approved as one of the following laboratory types:

1. **ASTM C 1293**
2. **ASTM C 1567**
3. **ASTM C 1293/1567**

2.0 PURPOSE

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

3.0 AUTHORITY AND REFERENCES

3.1 **Authority.** Federal regulations (23 CFR Part 637) require the **Department** to establish an **Acceptance Program** for qualifying construction testing laboratories.

3.2 **References.**

1. IDOT Standard Specifications for Road and Bridge Construction
2. IDOT Manual of Test Procedures for Materials
3. AASHTO, ASTM, and IDOT Test Procedures
4. Code of Federal Regulations (23 CFR Part 637)
5. Department Policy MAT-15, "Quality Assurance Procedures for Construction"

4.0 DEFINITIONS

AASHTO - American Association of State Highway and Transportation Officials.

AASHTO R 18 - The **AASHTO** Standard for "Establishing and Implementing a Quality System for Construction Materials Laboratories." The principles and/or requirements of **AASHTO R 18** are used by the **Bureau** to administer the **Qualified Laboratory** program for **Private ASR Testing Laboratories**.

ACCEPTANCE PROGRAM - All factors that comprise the **Department's** determination of the quality of the product as specified in the contract requirements.

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

ASTM - American Society for Testing Materials.

ASTM C 1077 - The **ASTM** "Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation" The principles and/or requirements of **ASTM C 1077** are used by the **Bureau** to administer the **Qualified Laboratory** program for **Private ASR Testing Laboratories**.

BUREAU - Central Bureau of Materials (CBM), Illinois **Department** of Transportation.

BUREAU LABORATORY - The **Department's** central laboratory maintained and operated by the **Bureau**. The **Bureau Laboratory** administers the **Qualified Laboratory** program for **Private ASR Testing Laboratories**.

CCRL – Cement and Concrete Reference Laboratory.

CONSULTANT - A private firm which performs construction materials testing for the **Department, Producer, or Contractor**.

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.

FHWA - Federal Highway Administration

PRIVATE ASR TESTING LABORATORY – An ASR construction materials testing laboratory not operated by the **Department** or a **Local Agency**.

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

QUALIFIED LABORATORY - A laboratory that is inspected and approved by the **Department**. FHWA's 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 capability to perform the applicable inspection and testing.

SPECIFICATIONS - Specifications for materials; manufactured, fabricated or constructed items; processes; products; designs; conducted test procedures, etc. which includes the **Standard Specifications**, supplemental specifications and recurring special provisions, highway standards, shop drawings, contract plans, project special provisions, **AASHTO Specifications**, **ASTM Specifications**, etc., as applicable.

STANDARD SPECIFICATIONS - The **Department's** Standard Specifications for Road and Bridge Construction.

TECHNICAL MANAGER - The individual with responsibility for the overall operations, condition, and maintenance of the **Private ASR Testing Laboratory**. The **Technical Manager** shall be identified in writing.

5.0 PRIVATE ASR TESTING LABORATORY REQUIREMENTS

5.1 Personnel Qualifications/Responsibilities.

5.1.1 All testing for **Department** contracts shall be performed by **Qualified Personnel** as determined by the **Bureau**.

5.2 Facilities and Equipment.

5.2.1 The **Department** will approve all **Private ASR Testing Laboratories** used on **Department** projects.

5.2.2 Each **Private ASR Testing Laboratory** shall have adequate floor space to efficiently conduct the required tests for each laboratory type it is approved for.

5.2.3 Each **Private ASR Testing Laboratory** shall have HVAC equipment capable of maintaining a room temperature of 68-86° F (20 to 30° C).

5.2.4 Each **Private ASR Testing Laboratory** shall maintain the equipment and facilities necessary to perform the tests required for each laboratory type it is approved for.

5.2.4.1 **Qualified Laboratory Type: ASTM C 1293.** Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1293** shall have the following, at a minimum:

1. Specified, documented, source for nonreactive coarse and fine aggregates according to **ASTM C 1293**
2. Specified, documented source for cement according to **ASTM C 1293**
3. Moist room according to **ASTM C 511** (e.g., temperature and relative humidity measuring device(s), humidification device, etc.)
4. Temperature controlled storage environment capable of maintaining 100.4 ± 3.6 °F (38.0 ± 2.0 °C) according to **ASTM C 1293**

5. Length comparator according to **ASTM C 490**
6. Storage containers according to **ASTM C 1293**
7. Sodium hydroxide (NaOH) according to **ASTM C 1293**
8. One example of a mix design according to **ASTM C 1293**
9. Ability to meet mixing requirements according to **ASTM C 192, ASTM C 143, ASTM C 138, and ASTM C 157**

5.2.4.2 **Qualified Laboratory** Type: **ASTM C 1567**. Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1567** shall have the following, at a minimum:

1. Storage oven or water bath according to **ASTM C 1567**
2. Controlled environment for mixing and molding according to **ASTM C 1567**
3. Moist room according to **ASTM C 511** (e.g., temperature and relative humidity measuring device(s), humidification device, etc.)
4. Specimen molds according to **ASTM C 490**
5. Gage studs according to **ASTM C 490**
6. Length comparator according to **ASTM C 490**
7. Reference bar according to **ASTM C 490**
8. Storage containers according to **ASTM C 1567**
9. Sodium hydroxide (NaOH) according to **ASTM C 1567**
10. Type IV reagent water according to **ASTM D 1193**
11. Nos. 4, 8, 16, 20, 30, 50, and 100 sieves according to **ASTM E 11**
12. Tamper and trowel according to **ASTM C 109**
13. Mixer, paddle, and bowl according to **ASTM C 305**
14. Flow table according to **ASTM C 230**

5.2.4.3 **Qualified Laboratory** Type: **ASTM C 1293/1567**. Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1293** and **ASTM C 1567** shall meet the requirements of 5.2.4.1 and 5.2.4.2.

6.0 QUALITY SYSTEM CRITERIA

6.1 CCRL Inspection and Comparison Testing.

6.1.1 **Qualified Laboratory** Type: **ASTM C 1293**. Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1293** shall have been inspected by **CCRL** for that test, and successfully compared results with the **Bureau Laboratory**. **CCRL** inspection and successful comparison of test results with the **Bureau Laboratory** are a prerequisite for **Departmental** inspection.

6.1.2 **Qualified Laboratory** Type: **ASTM C 1567**. Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1567** shall have been inspected by **CCRL** for that test, and successfully compared results with the **Bureau Laboratory**. **CCRL** inspection and successful comparison of test results with the **Bureau Laboratory** are a prerequisite for **Departmental** inspection.

6.1.3 **Qualified Laboratory** Type: **ASTM C 1293/1567**. Each **Private ASR Testing Laboratory** approved by the **Department** to perform **ASTM C 1293** and **ASTM C 1567** shall meet the requirements of 6.1.1 and 6.1.2.

- 6.2 **Technical Manager.** Each **Private ASR Testing Laboratory** shall have a **Technical Manager** (however titled) who has overall responsibility for the technical operations of the **Private ASR Testing Laboratory**. The **Technical Manager** shall be responsible for equipment maintenance, calibration, standardization, verification and checks; maintaining records; and ensuring that current test procedures are utilized.
- 6.3 **Equipment Calibration, Standardization, Verification and Checks.** The **Private ASR Testing Laboratory** shall calibrate, standardize, verify or check all testing equipment associated with tests performed for each laboratory type it is approved. Calibration, standardization, verification and check intervals for each piece of testing equipment shall be according **Department** Policy Memorandum 6-08, **AASHTO R 18**, or as specified in a particular test method, as applicable.
- 6.4 **Department Proficiency Testing.** **Private ASR Testing 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 ASR Testing Laboratory** to conduct **ASTM C 1293** and/or **ASTM C 1567**.
- 6.5 **Records.**
- 6.5.1 **Test Records.** Each **Private ASR Testing Laboratory** shall maintain test records which contain sufficient information to permit verification of any test report.
- 6.5.2 **Laboratory Quality Records.** Each **Private ASR Testing Laboratory** shall maintain documentation of internal quality controls. At a minimum, the records shall include:
1. Documentation of assignment of personnel responsible for internal quality controls
 2. Documentation of equipment calibration, standardization, verification and checks
 3. All documentation shall be maintained and available for **Department** inspection for a period of three years
- 6.5.2.1 **Equipment Calibration, Standardization, Verification and Check Records.** Calibration, standardization, verification and check records shall include the minimum information listed below. **AASHTO R 18** and **ASTM C 1077** may provide additional guidance for recording calibration, standardization, verification and check records for testing equipment.
1. Description
 2. Model & Serial Number
 3. Name of person calibrating, standardizing, verifying or checking
 4. Equipment used for calibration, standardization, verification or checks
 5. Date calibrated, standardized, verified, or checked & next due date
 6. Reference procedure used
 7. Results of calibration, standardization, verification or checks
- 6.5.3 **Proficiency Sample Records.** Each **Private ASR Testing 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.
- 6.6 **Publications.** Each **Private ASR Testing Laboratory** shall maintain current copies or electronic access to the required test procedures for each laboratory type it is approved

for. Each **Private ASR Laboratory** shall maintain a current copy or electronic access to the Manual of Test Procedures for Materials.

7.0 LABORATORY INSPECTIONS

7.1 **General.** The **Department** will approve **Private ASR Testing Laboratories** by inspection and other requirements, as applicable.

7.2 **Travel Reimbursement.** The **Private ASR Testing Laboratory** shall be responsible for payment of transportation, per diem (meals), lodging, and incidental travel costs incurred by the **Bureau** if the trip from the **Bureau** to the **Private ASR Testing Laboratory**, the **Private ASR Testing Laboratory** inspection, and the return trip to the **Bureau** cannot be completed within one day's normal work hours of 8:00 AM to 4:30 PM. Reimbursement for travel costs shall be provided no later than 30 calendar days after receipt of costs submitted by the **Department**.

7.3 **AASHTO Accredited Private ASR Testing Laboratories.** **AASHTO** accreditation does not waive the right of the **Department** to conduct inspections and/or re-inspections.

7.4 **Private ASR Testing Laboratory Inspection Scope.**

1. Facilities - Physical and environmental conditions
2. Equipment - Test apparatus for specification compliance
3. Documentation - Calibration, standardization, verification and check records
4. Personnel - A review of **Qualified Personnel** credentials
5. Observation - The **Private ASR Testing Laboratory** may be required to demonstrate required tests. Some test procedures may be evaluated through discussion with laboratory personnel.
6. Split or Comparison Sample Testing - Results of split or comparison sample testing between the **Private ASR Testing Laboratory** and the **Bureau**
7. Proficiency Sample Testing - Results of proficiency sample testing programs conducted by the **Bureau**
8. Report - The **Private ASR Testing Laboratory** will be provided with a report listing those tests for which it is approved. The report will note deficiencies.

7.5 **Private ASR Testing Laboratory Inspection Procedure.**

7.5.1 The **Private ASR Testing Laboratory** shall submit a written request for an inspection to the **Bureau**. The request shall indicate the following:

1. The location of the **Private ASR Testing Laboratory**
2. The type of **Private ASR Testing Laboratory**, i.e., **ASTM C 1293**, **ASTM C 1567**, **ASTM C 1293/1567**
3. The name of the **Technical Manager** who will be present for the inspection
4. The date the **Private ASR Testing Laboratory** will be ready for inspection

7.5.2 **Bureau** personnel will establish a tentative date to perform the inspection.

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

- 7.5.4 **Bureau** personnel will assign identification numbers to all test equipment.
- 7.5.5 **Bureau** personnel will perform a close-out with the **Technical Manager**. The **Technical Manager** will be given a copy of the preliminary report.
- 7.5.6 If a review of the preliminary report indicates there are no deficiencies, the **Bureau** will provide written notification to the **Private ASR Testing Laboratory** indicating the **Private ASR Testing Laboratory** is now approved. The notification will include an equipment list.
- 7.5.7 If the preliminary report indicates there are deficiencies, the **Bureau** will provide written notification to the **Private ASR Testing Laboratory**, indicating the deficiencies and that corrective action is required.
- 7.5.8 After correction of all cited deficiencies, the **Private ASR Testing Laboratory** shall notify the **Bureau**. The **Bureau** will re-inspect the **Private ASR Testing Laboratory** to verify the deficiencies have been corrected.
- 7.5.9 The **Bureau** will provide written notification to the **Private ASR Testing Laboratory**, indicating the **Private ASR Testing Laboratory** is now an approved lab. The notification will include an equipment list.
- 7.5.10 Uncorrected deficiencies will not be waived. Equivalent equipment specifications may be approved only with the written approval of the **Bureau's** Engineer of Concrete, Soils, and Metals.
- 7.6 Re-Approval of Approved Private ASR Testing Laboratories.**
- 7.6.1 The re-inspection of **Private ASR Testing Laboratories** will be conducted at intervals deemed appropriate by the **Bureau**. The interval between inspections will not exceed two calendar years. The **Bureau's** evaluation may include the following:
1. Physical inspection of the laboratory facility and equipment
 2. Review of the **Private ASR Testing Laboratory's** internal quality plan and documentation in accordance with this policy and those parts of **AASHTO R 18** and **ASTM C 1077** incorporated by this policy
 3. Observations of tests performed by **Qualified Personnel**
 4. Results of split sample testing between the **Private ASR Testing Laboratory** and the **Bureau**
 5. Results of proficiency sample testing programs conducted by the **Bureau**
 6. Overall past performance and experience
- 7.6.2 The **Bureau** will issue a letter of re-approval to the **Private ASR Testing Laboratory**, or provide a written and itemized deficiency list. The **Private ASR Testing Laboratory** shall notify the **Bureau** when deficiencies are corrected and ready for re-inspection.
- 7.6.3 At any time, if the **Bureau** identifies deficiencies in the facility, equipment, or test procedures that could affect the results of any tests, the **Bureau** will require the **Private ASR Testing Laboratory** to take immediate action to correct the deficiency.

8.0 LABORATORY DATABASE AND APPROVED LIST

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

1. Laboratory Codes (**Department, Producer**, etc.)
2. Type Laboratory (**ASTM C 1293, ASTM C 1567, ASTM C 1293/1567**)
3. Demographics (Address, etc.)
4. Date Inspected
5. Approval Status

8.2 Approved List. The **Department** will maintain two lists of approved **Private ASR Testing Laboratories** on the Internet. The lists will be entitled "Approved List of Laboratories to Perform Alkali-Silica Reactivity (ASR) ASTM C 1293" and "Approved List of Laboratories to Perform Alkali-Silica Reactivity (ASR) ASTM C 1567", and will include the following information:

1. Laboratory Name
2. Address
3. Contact Person and Title
4. Phone No.
5. Website

The **Department** may remove a **Private ASR Testing Laboratory** from the list if deficiencies in the facility, equipment, or test procedures are indicated through inspections, proficiency testing, or other circumstances, unless the **Private ASR Testing Laboratory** takes immediate action and corrects the deficiency.

9.0 CLOSING NOTICE

Archived versions of this policy memorandum may be examined by contacting the **Bureau**.

The current **Bureau** Chief of Materials has approved this policy memorandum. Signed documents are on file with the **Bureau**.