

State of Illinois
Illinois Department of Transportation
Division of Highways
Bureau of Materials and Physical Research
Springfield

POLICY MEMORANDUM

Effective: June 21, 2013

29-11.2

This Policy Memorandum supersedes number 29-11.1 dated October 15, 2012

TO: REGIONAL ENGINEERS AND HIGHWAY BUREAU CHIEFS
AND ASR TESTING LABORATORIES

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

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 minimum laboratory requirements for **ASR Testing Laboratories**.

ALKALI-SILICA REACTIVITY (ASR) TESTING LABORATORY - Any laboratory that performs ASTM C 1567 and/or ASTM C 1293 tests. This includes **Contractor**, **Producer**, or **Consultant** laboratories.

BMPR LABORATORY - The Department's central laboratory maintained and operated by the Bureau of Materials and Physical Research (BMPR).

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.

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

TECHNICAL MANAGER - The individual with responsibility for the overall operations, condition, and maintenance of the **ASR Testing Laboratory**.

2.0 SCOPE

This policy governs the minimum qualifications for **Alkali-Silica Reactivity (ASR) Testing Laboratories** operated by **Contractors**, **Producers** and **Consultants**.

3.0 **PURPOSE**

To ensure that **ASR Testing Laboratories** are equipped and maintained at a uniform and high level of quality.

To establish a uniform procedure for evaluating and approving **ASR Testing Laboratories**.

4.0 **REFERENCE DOCUMENTS**

IDOT Standard Specifications for Road and Bridge Construction.

Applicable Special Provisions.

AASHTO, ASTM, and IDOT Test Procedures.

5.0 **ALKALI-SILICA REACTIVITY TESTING LABORATORY REQUIREMENTS**

All alkali-silica reactivity testing for **Department** contracts shall be performed by **ASR Testing Laboratories** approved by the **Department** and listed on the **Approved Lists of Laboratories to Perform Alkali-Silica Reactivity (ASR) Tests** as maintained by the **Department**.

5.1 **Facilities and Equipment Requirements**

5.1.1 Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1293 shall have the following, at a minimum:

- HVAC equipment capable of maintaining a room temperature of 68-86 °F (20-30 °C) all year
- Specified, documented, source for nonreactive coarse and fine aggregates according to ASTM C 1293
- Specified, documented source for cement according to ASTM C 1293
- Moist room according to ASTM C 511 (e.g., temperature and relative humidity measuring device(s), humidification device, etc.)
- Temperature controlled storage environment capable of maintaining 100.4 ± 3.6 °F (38.0 ± 2.0 °C) according to ASTM C 1293
- Length comparator according to ASTM C 490
- Storage containers according to ASTM C 1293
- Sodium hydroxide (NaOH) according to ASTM C 1293
- One example of a mix design according to ASTM C 1293
- Ability to meet mixing requirements according to ASTM C 192, ASTM C 143, ASTM C 138, and ASTM C 157
- Copy of the **Department's** Manual of Test Procedures for Materials

5.1.2 Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1567 shall have the following, at a minimum:

- Storage oven or water bath according to ASTM C 1567
- Controlled environment for mixing and molding according to ASTM C 1567
- Moist room according to ASTM C 511 (e.g., temperature and relative humidity measuring device(s), humidification device, etc.)
- Specimen molds according to ASTM C 490

- Gage studs according to ASTM C 490
- Length comparator according to ASTM C 490
- Reference bar according to ASTM C 490
- Storage containers according to ASTM C 1567
- Sodium hydroxide (NaOH) according to ASTM C 1567
- Type IV reagent water according to ASTM D 1193
- Nos. 4, 8, 16, 20, 30, 50, and 100 sieves according to ASTM E 11
- Tamper and trowel according to ASTM C 109
- Mixer, paddle, and bowl according to ASTM C 305
- Flow table according to ASTM C 230

6.0 **QUALITY SYSTEM CRITERIA**

6.1 **Inspection**

Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1567 shall have been inspected by the Cement and Concrete Reference Laboratory (CCRL) for that test.

Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1293 shall have been inspected by the Cement and Concrete Reference Laboratory (CCRL) for that test.

6.2 **Technical Manager**

Each **ASR Testing Laboratory** shall have a **Technical Manager** (however titled) who has overall responsibility for the technical operations of the **ASR Testing Laboratory**. The **Technical Manager** shall be responsible for equipment maintenance and calibration, maintaining records, and ensuring that current test procedures are utilized.

6.3 **Equipment Calibration and Verification**

The **ASR Testing Laboratory** or designee shall calibrate or verify all testing equipment associated with tests performed by the **ASR Testing Laboratory**. The frequency shall be per the test method.

6.4 **Proficiency Testing**

ASR Testing Laboratory qualifications will include successful comparison of ASTM C 1567 testing by the **ASR Testing Laboratory** and **BMPR Laboratory**. Results will be considered in the overall evaluation of the **ASR Testing Laboratory** to conduct ASTM C 1567.

Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1567 may be required to periodically participate in round-robin proficiency testing conducted by the **Department**.

Each **ASR Testing Laboratory** approved by the **Department** to perform ASTM C 1293 may be required to periodically participate in round-robin proficiency testing conducted by the **Department**.

Round-robin proficiency testing will be administered by the **BMPR Laboratory**. Round-robin proficiency tests shall begin within 2 weeks of receipt of materials, and

results shall be submitted to the **BMPR Laboratory** within 2 weeks of completion.

6.5 Records

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

Records Retention – Each **ASR Testing Laboratory** shall maintain documentation of the 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.
3. Logs of sample pick-up shall be maintained for a minimum period of three years.
4. All documentation shall be maintained and available to **Department** inspection for a period of three years.

Equipment Calibration and Verification Records – Calibration records shall include the minimum information listed below. **AASHTO R 18** and **ASTM C 1222 or ASTM C 1077** provides 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

Technical Training and Evaluation Records – Each **ASR Testing Laboratory** shall maintain records of technician training and evaluation.

6.6 Publications

Each **ASR Testing Laboratory** shall maintain current copies of all test procedures performed.

7.0 **LABORATORY INSPECTIONS**

7.1 **CCRL Inspected ASR Testing Laboratories**

Inspection by CCRL of the **Contractor, Producer, or Consultant** laboratory is a prerequisite for approval as an **ASR Testing Laboratory**. A copy of the final CCRL inspection report shall be provided to the **BMPR Laboratory** or approval for access to the report by other means shall be given.

CCRL inspection does not waive the right of the **Department** to conduct inspections. The **BMPR Laboratory** will provide written notification to the **ASR Testing Laboratory**, indicating the approval. Approval will be based on the results of the CCRL inspection and the results of the ASTM C 1567 test by the **ASR Testing Laboratory**.

7.2 Re-Approval of ASR Testing Laboratories

The re-approval of **ASR Testing Laboratories** shall be conducted by the **BMPR Laboratory** at the next CCRL inspection. Re-approval will be based on the results of the CCRL Inspection. A copy of the final CCRL inspection report shall be provided to the **BMPR Laboratory** or approval for access to the report by other means shall be given.

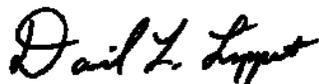
If the **BMPR Laboratory** determines that satisfactory results were obtained from the CCRL inspection, the **BMPR Laboratory** will provide written notification of re-approval to the **ASR Testing Laboratory**.

8.0 APPROVED LABORATORY LISTS

The **Department** will maintain two lists of approved **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 Phone No.
4. Approved Tests
5. Website

The **Department** may remove an **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 **ASR Testing Laboratory** takes immediate action and corrects the deficiency.



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